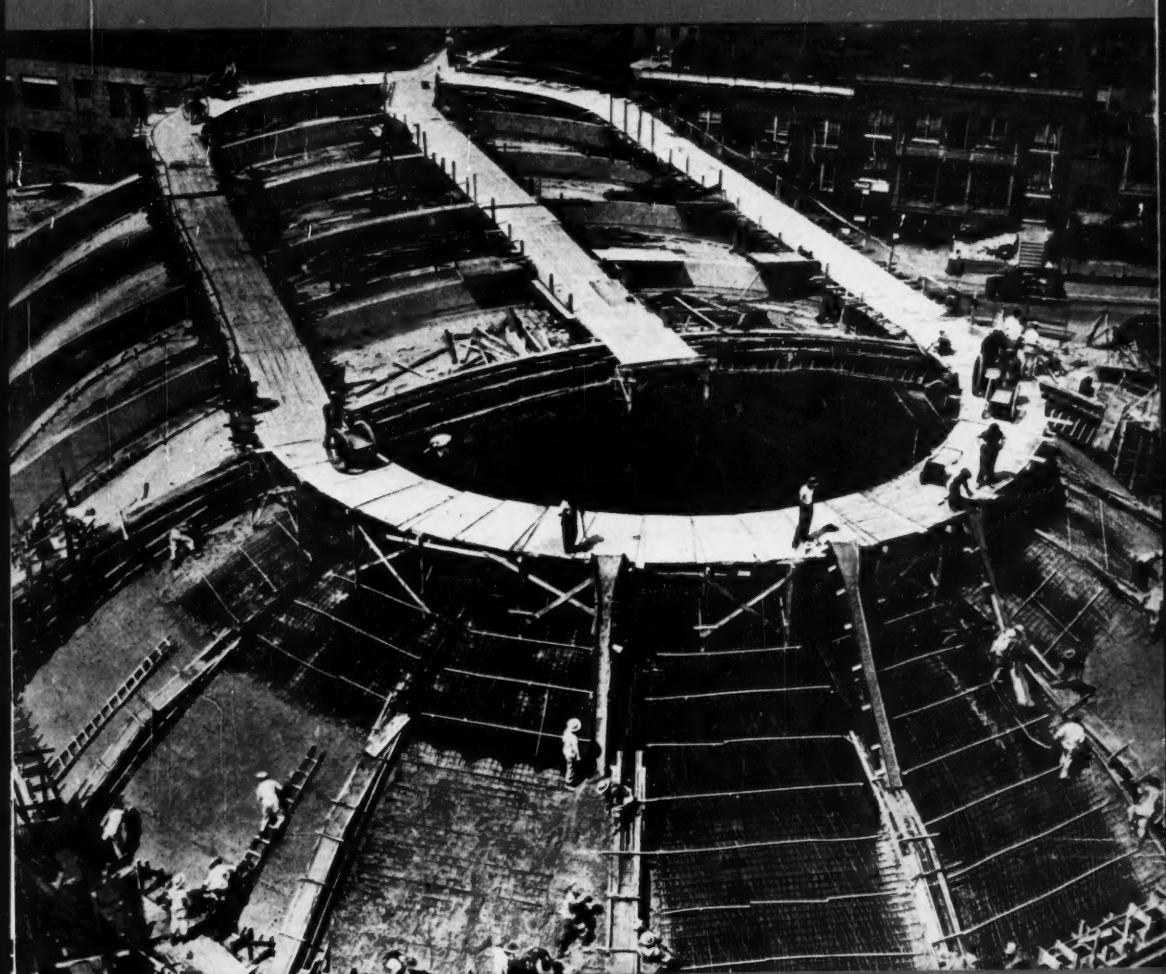


Construction Methods

FEBRUARY 1949

A McGRAW-HILL PUBLICATION



Thin-shell concrete dome roof poured in rolling forms for Washington, D. C., skating rink.

It Pays to ORGANIZE Your Office

First of a Series on Construction Job Office Procedure



These 5 Tests Prove Reinforcing Superiority of Inland HI-BOND!

SUBJECT	TEST RESULTS	SUBJECT	TEST RESULTS
1. Bond characteristics of Hi-Bond Reinforcing Bars compared with ordinary non-deformed bars and partly deformed bars.	Composite averages for all bars, slips, and concretes tested show Hi-Bond bars bond and maintain bond at a load stress of 57% greater than transverse lug bars, 83% greater than longitudinal lug bars, and 134% greater than plain bars. <i>Frank E. Richart, U. of Ill.</i>	2. Strength and slip under load of bent-bar anchorage and straight embeddings of Hi-Bond compared to other reinforcing bars.	<i>Straight</i> Hi-Bond bars embedded in concrete resisted slip better than ordinary reinforcing bars with end hooks. The resistance to slip of bent-bar anchorages of Hi-Bond was not significantly greater than straight Hi-Bond anchorages. <i>C. C. Fishburn, Natl. Bu. Stds.</i>
3. The resistance to slip of Hi-Bond compared with ordinary deformed reinforcing bars when lapped and spliced.	In comparison to ordinary deformed reinforcing bars, in which all were lap-spliced, Hi-Bond picked up stress at the free end of the splice more rapidly. Hi-Bond slipped considerably less under a given load than the other bars tested. <i>R. W. Kluge, E. C. Tuma, Natl. Bu. Stds.</i>	4. Resistance to the widening of cracks in tensile-stressed concrete provided by Hi-Bond as compared to other bars.	Width of the cracks was least in concrete cylinders reinforced with Hi-Bond. Hi-Bond not only retarded cracking under a sustained load but maintained a consistently greater resistance to widening cracks under repeated applications of maximum loads. <i>David Wutstein, N. A. Seese, Jr., Natl. Bu. Stds.</i>
5. Comparison of the resistance to slip in concrete of Hi-Bond and 16 other different designs of deformed reinforcing bars.	Hi-Bond consistently placed highest among the other bars tested. Its average bonding efficiency was considerably greater than its nearest competitor, and more than twice as great as the lowest bonding strength commercial bar tested. <i>Arthur Clark, Natl. Bu. Stds.</i>		

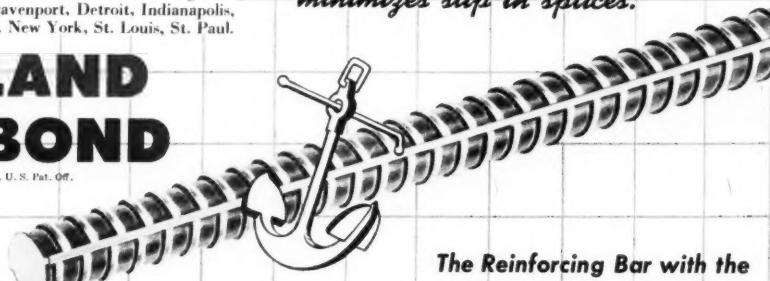
Reprints of the above tests are available upon request.
Write to:

INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill.
Sales Offices: Chicago, Davenport, Detroit, Indianapolis,
Kansas City, Milwaukee, New York, St. Louis, St. Paul.

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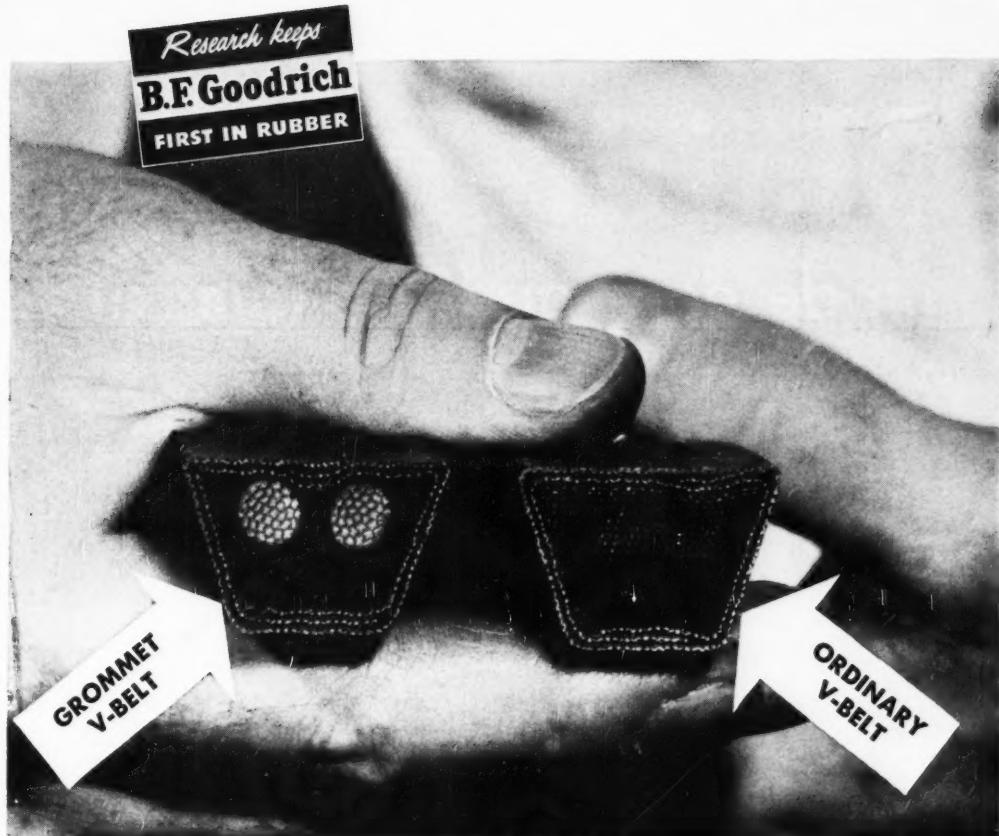
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The Reinforcing Bar with the
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Lasts longer, stands shock loads better, costs no more

A NEW patented construction by B. F. Goodrich puts all the cord material in a V-belt to work in the form of twin, endless, extra-flexible grommets — *not* cables — placed close to the driving faces of the belt (see left, above). No "lazy" cords in the interior to shirk their share of the load. Because grommets are endless they are more flexible, with no stiff section such as occurs in an ordinary cable, with spliced or overlapped ends.

Wby twin grommet construction? When an ordinary large-sized V-belt (right, above) goes into the sheave its sides are squeezed by the pulley, forc-

ing the center cords downward and out of the line of load-carrying stress. Belt men call this "dishing", because the cord section becomes concave, like a dish. With twin grommet construction there are no center cords, no "dishing" — as the belt goes into the pulley the grommets remain on the job, close to the driving surfaces of the belt.

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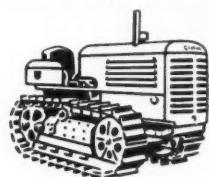
lasted from 20 to 50% longer than ordinary V-belts. Reasons: no cord overlaps (85% of ordinary V-belts fail in the overlapped section), no sawing cords, less heat.

How to get genuine grommet V-belts — Twin grommet construction is an exclusive, patented B. F. Goodrich development — no other manufacturer can make grommet V-belts. Now available in "D" and "E" sections. To be sure you get genuine grommet V-belts see your B. F. Goodrich distributor. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

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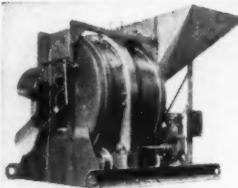
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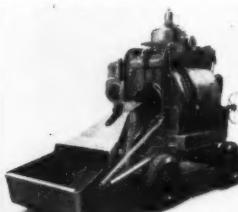


MIXERS



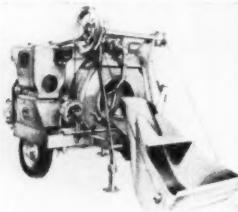
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WATERLOO, IOWA

Construction Methods

ESTABLISHED 1919

Volume 31

FEBRUARY 1949

Number 2

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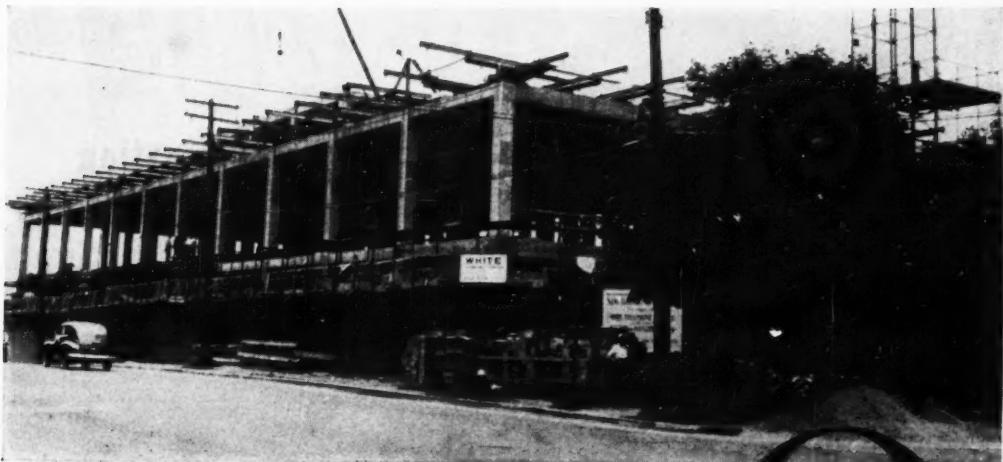
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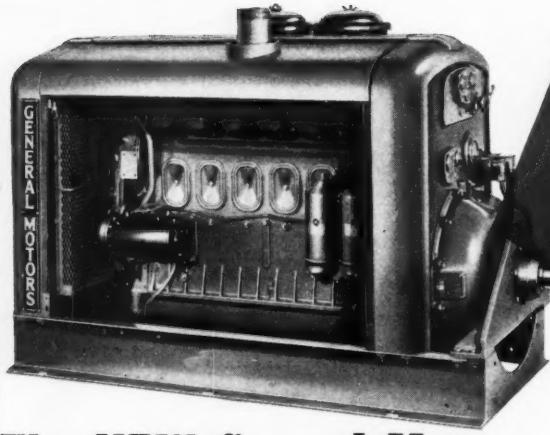
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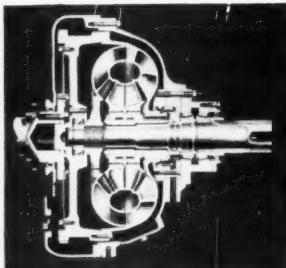
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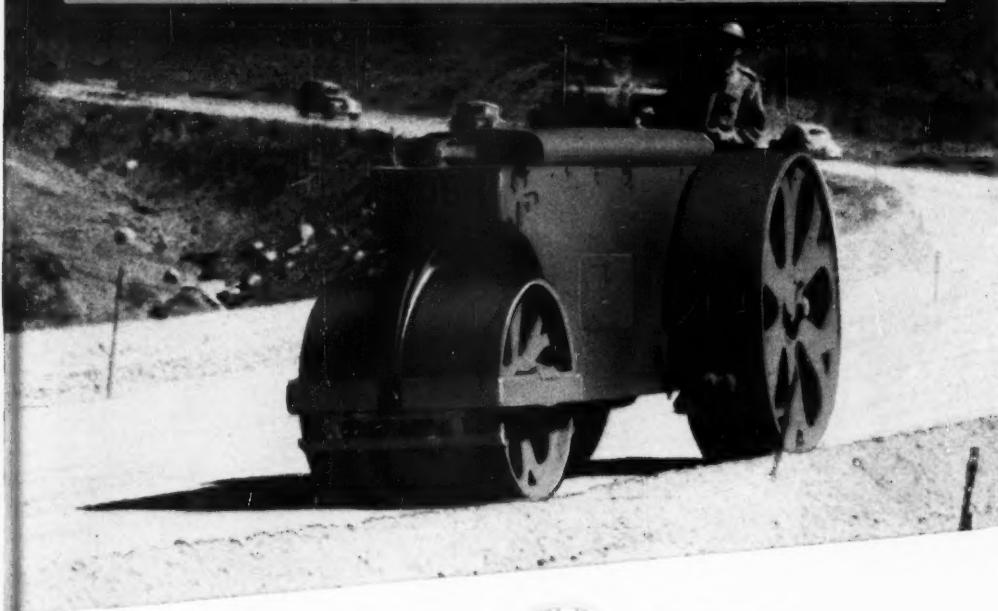
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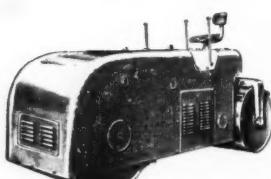
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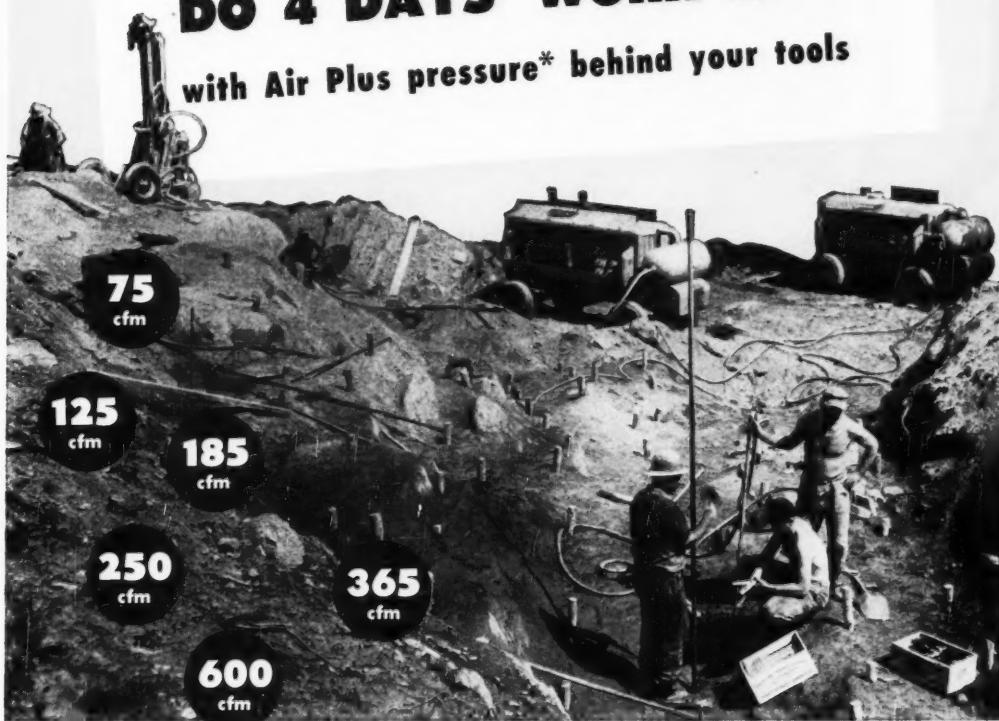
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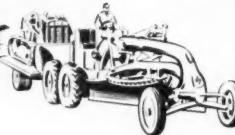
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SEND FOR NEW
FREE BOOKLET



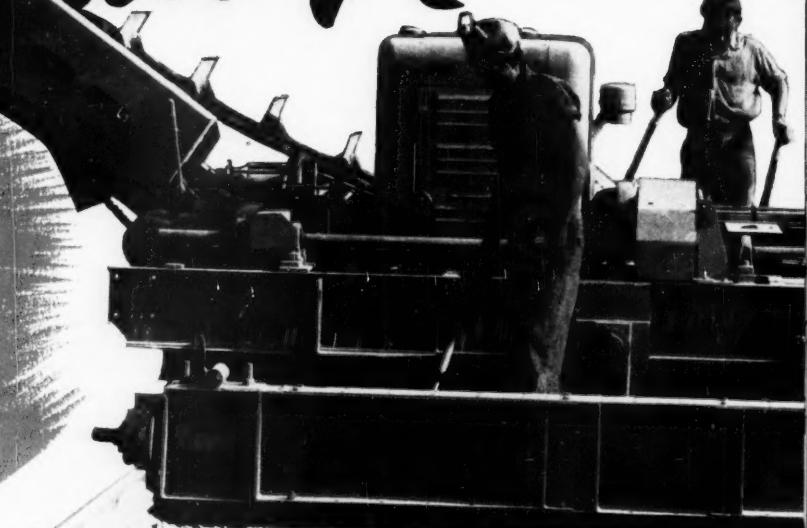
AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

...from rough subgrade to finished

Blaw-Knox



Here's a complete concrete paving outfit that will give you better pavement with the fewest men, at lowest cost, in the shortest time — starting with the Blaw-Knox Self-Aligning Road Forms, then the new Blaw-Knox Precision Subgrader, Aggregate Batching and Bulk Cement Plants, the MultiFoote Paver and following through with the combination of Blaw-Knox Concrete Paving Spreader and Finishing Machine. Your pavement will be off to a flying start when you use a Blaw-Knox Precision Subgrader to insure accurate control of slab thickness — low cost for the most expensive type of excavation — uniform cross-section for the subgrade — and plenty of finished grade for any high speed paving operation. For all your concrete construction work — standardize on Blaw-Knox equipment. One manufacturer and one responsibility for quality, performance and low cost.

BLAW-KNOX

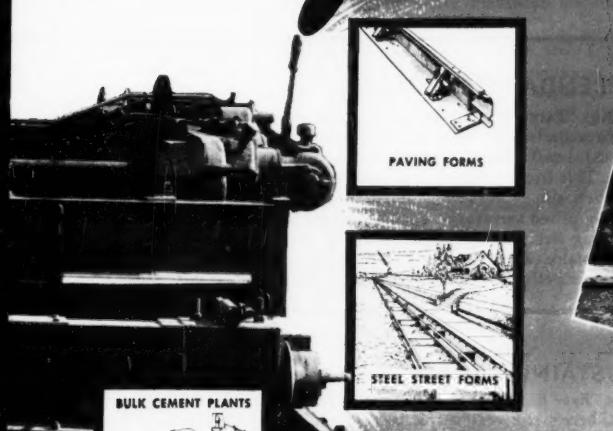
BLAW-KNOX DIVISION OF Blaw-Knox Company,
Farmers Bank Building,
Pittsburgh 22, Pa.

The Foote Co., Inc.,
Subsidiary of Blaw-Knox Co.,
Nunda, N. Y.

pavement all the way!



A MULTIFOOTE 34-E DUOMIX PAVING MIXER with its fast charge and discharge gets the concrete on the subgrade in a hurry. The Elevating Boom makes the MultiFoote an all-round high-speed construction tool that will eliminate extra equipment and high costs in the pouring of forms.



BULK CEMENT PLANTS



ADNU BLACK TOP PAVERS



AGGREGATE BATCHING PLANTS



CLAMSHELL BUCKETS



A BLAW-KNOX CONCRETE PAVING SPREADER can automatically spread the harsh, dry mixes of two 34-E dual drum pavers no matter where the concrete is placed on the subgrade between forms.



A BLAW-KNOX FINISHING MACHINE following a Blaw-Knox Spreader will give you record smashing production and highest quality of finish of concrete pavement regardless of the type of concrete mix specified or required.



New York • Chicago • Philadelphia

Birmingham • Washington

Representatives in Principal Cities

EXPORT DEPARTMENT

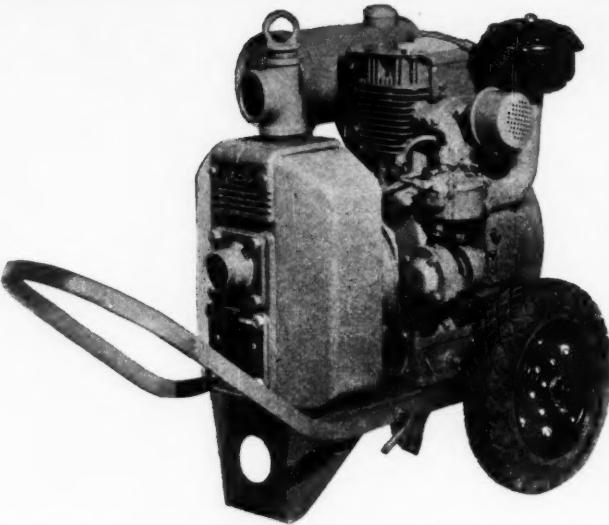
342 Madison Ave., New York, N.Y.

Cable Address—BlawKnox, Pittsburgh

"Easy Flow"

for

EASY PUMPING



DEPENDABILITY PLUS

A Rex "Easy Flow" Pump is dependability itself... not for just one season but for many a year of tough service. Note the rugged press-formed pump body with its glass-smooth steel interior surface. This frictionless surface permits the smoothest flow of water through the pump... increases pump efficiency. There are no rough, pitted surfaces to encourage corrosion and early wear. No priming delays with this design. And note the straight line suction intake. Water takes a slightly downhill flow right to the eye of the impeller with least possible friction loss.

SUSTAINED EFFICIENCY

Rex "Easy Flow" has a replaceable liner plate and a lifetime seal. But, here's the real secret behind the ability of the Rex "Easy Flow" to give you new pump efficiency for the lifetime of the pump. The *exclusive* adjustable air peeler is easily adjusted to restore original clearance with the impeller to compensate for wear... assuring the ability in an old pump to give you original priming efficiency at maximum suction lifts.

LIGHT WEIGHT

With its press-formed body and volute, the Rex "Easy Flow" is approximately 30% lighter than cast styles. It's easy to handle... easy to spot. Yet this pump is the most durable in the field... proved in actual applications. Engine is located over the wheels so you lift only the weight of the pump when wheeling from spot to spot.

For all the facts, see your Rex Distributor or write for your copy of Bulletin No. 47-12. Chain Belt Company, 1664 West Bruce Street, Milwaukee 4, Wis.



CONSTRUCTION MACHINERY

In all construction...

IT'S A CINCH WITH

TULSA WINCH

A Tulsa Winch on your truck will increase its working capacity, give trouble-free performance with dependability and SAFETY. Tulsa Winches are built in standard models, and in special electrical utility models for many uses . . . lifting, hauling, pulling, stretching cable, etc.

Tulsa Winch will HOLD THE LOAD. Men and loads are safe due to the positive exclusive back-off brake.

TULSA WINCH WITH EXTENDED DRUM SHAFT

Built to Specifications for Public Utility Companies.
Note Detachable Cathead and Adapter. Write for
Bulletin.



Tulsa Winch

TULSA, OKLAHOMA

DIVISION OF
VICKERS INC.

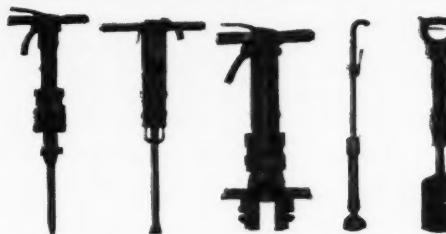
WORTHINGTON-RANSOME
An Outstanding Line of



WORTHINGTON PUMP AND MACHINERY CORPORATION • WORTHINGTON - RANSOME

BLUE BRUTES

Construction Equipment



Worthington Blue Brute hand-held air tools include: Paving Breakers, Rock Drills, Sheeting Drivers, Back Fill Tampers, Clay Diggers and Trench Diggers. Tough and powerful, but with the easy handling that means more work done — faster.



Worthington Blue Brute Portable Self-Priming Centrifugal Pumps. Plenty of reserve power, with fast, dependable pickup. A full range of sizes. Pneumatic tires, steel wheels, or base mounted.



Worthington Blue Brute Drifter, type WPMS (Pneu-Motor on Shell). Other types: WPM (Pneu-Motor incorporated in Drifter) and WHC (Hand Crank). Hard slingers all the way, with the balance that speeds up drilling cycles. All types in 3", 3½" and 4" sizes, with standardized mountings.



Worthington Blue Brute UMW-40 Wagon Drill. Carries 4" Blue Brute Drifter on a rugged frame that swings into fast action at any angle.



Worthington Blue Brute Portable Air Compressor, 160' capacity. With the exclusive Feather® Valves that get all the air power out of every drop of fuel. Other sizes: 30', 60', 105', 210', 315', 500' capacities. Gasoline or Diesel power. Power take-off models. All types of mountings.



Ransome Blue Brute Hi-Up Truck Mixers: 2, 3, 4½ yd mixers (3, 4½, 6½ yd agitators). Horizontal models: 4½ yd mixers (6½ yd agitators). Outstanding for faster charging and discharging.



Ransome Blue Brute 3½-S Tilting Mixer. Quickly spotted and towed. Also available as Non-Tilter. Other Blue Brute Mixers: 6-S, 11-S, 16-S, 28-S Portables; 1, 2, 3, 4½ cu yd Stationary.



Ransome Blue Brute 34-E Dual Drum Paver. Also in Single Drum model; both models with the exclusive Ransome hydraulically controlled boom and bucket that permits completely controlled pouring.

ESTIMATE-BEATERS ALL!

Wherever you go, in the U. S. or abroad, you'll find Blue Brutes hard at work on every type of construction project. Never before has one manufacturer offered so broad a line of related construction equipment . . . all Blue Brutes . . . all developments of Worthington-Ransome's more than a century of engineering leadership. You, like thousands of users everywhere, can always depend on Blue Brutes for up-to-the-minute design, rugged construction and exceptional perform-

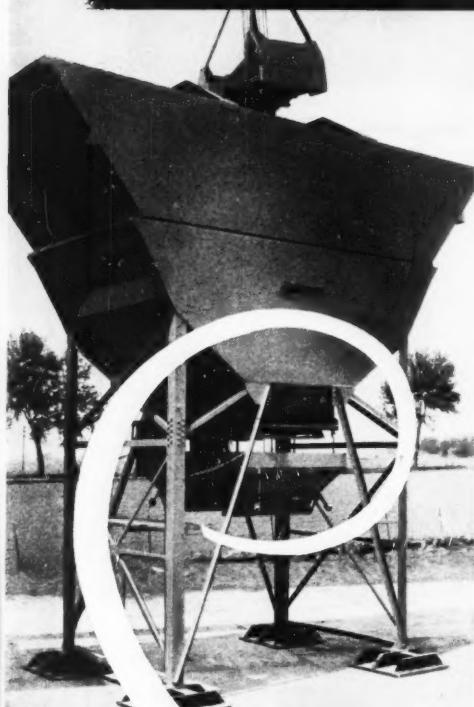
ance. For further facts proving there's more worth in Worthington, see your nearest Worthington-Ransome Distributor, or write direct.

**BUY BLUE BRUTES
WORTHINGTON**



*Reg. U. S. Pat. Off. 118-2

For more BATCHING SPEED....



JOHNSON Hi-Speed Batcher handles 2, 3 or 4 materials

Where you want high-speed batching and extreme accuracy for uniform strength concrete every batch, plus quick convertibility to handle 2, 3 or 4 materials, check the Johnson Roadbuilders' Hi-Speed Batcher. Its extra-wide fill valves permit high-speed filling, and retain minimum batcher height.

Standard Hi-Speed Batcher has wide-discharge hopper and scale beams to handle standard batch for 34-E pavers. Self-loading, counter-weighted discharge gate on weigh hopper is easily tripped . . . opens wide . . . extra-steep angle of bottom cleans out hopper fast.

For charging truck mixers, Hi-Speed Batcher can also be equipped with 2, 3 or 4-yd. weigh hoppers. Truck-mixer type has 4-compartment bin . . . 1 for sand, 2 for aggregates, and 1 enclosed compartment for cement. Both truck-mixer hopper and wide-discharge hopper are interchangeable on the scale frame. Overhead unit frame supports all fill valves, hand levers, aggregate hopper and weigh beam box . . . provides convenient reassembly, and insures accurate alignment of scale parts at all times.

Let your Johnson Distributor show you all the Hi-Speed Batcher features that will help you produce top-quality concrete fast, with most economical use of materials.

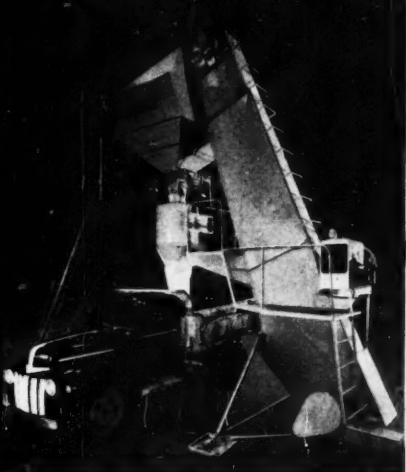
One or two Hi-Speed Batchers can be used with Johnson Roadbuilders' All-Purpose Type Bin (above)...gives you a big production combination.

Hi-Speed Batcher fill valves can be added or removed in the field, and the center spacing easily shifted for either 2, 3 or 4 material bins.



C. S. JOHNSON

.ACCURACY



Use JOHNSON Elevating Cement Charger as Batch or Transfer Plant

Here are quick facts on Johnson's new Elevating Cement Charger for batch plant operation or transfer plant to unload cement from either hopper-bottom or box-type railroad cars:

- Standard Charger has a size 14, 1000-lb. capacity cement weigh batcher, hung under a 33-bbl. overhead storage hopper.
- Upper hopper can be equipped with two 1000-lb. weigh batchers for charging dual-batch trucks.
- Quickly adapted from batch to transfer plant by adding 50-bbl. extension hopper.
- Has weather-tight, bucket-type elevator . . . 300 bbl.-per-hour rated capacity with buckets 80% filled.
- Extremely portable . . . easily moved and erected by standard dump truck. No crane needed.

CJ969

COMPANY
KOEHRING SUBSIDIARY
CHAMPAIGN • ILLINOIS

Save 25% with 205 shovel-pull shovel

Koehring ½-yard 205 has dual-purpose boom for both shovel and pull shovel operation . . . costs 20 to 25% less than conventional units requiring two separate booms. Crowd and retract cable is self-contained in boom . . . stays intact when boom is removed . . . saves time when you convert to crane, clamshell, dragline. Get all the facts in new 205 bulletin.



KOEHRING COMPANY

MILWAUKEE 16,
WISCONSIN

Every batch a perfect mix

Improved mixing action of the revolving drum of the Kwik-Mix 16-S Dandie mixes every batch of concrete for perfect texture. You get better concrete because every particle of the aggregate is completely cement-coated. Same thorough mix in all Kwik-Mix Dandie mixers including 3½-S, 6-S, and 11-S sizes.



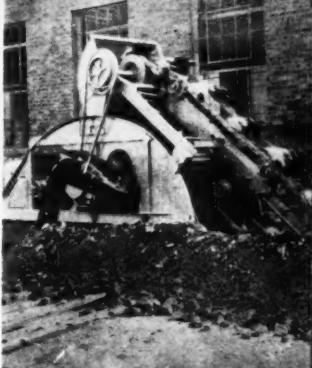
KWIK-MIX COMPANY

KOEHRING SUBSIDIARY

MILWAUKEE 16,
WISCONSIN

Sidesteps side obstructions

Boom of the Parsons 221 Trenchliner® quickly and easily rides on rollers from side to side across the full width of the Trenchliner. That's why the Parsons 221 Trenchliner can cut a trench as close as 10" from side obstructions. Trenches up to 8' depth, 16" to 36" wide.



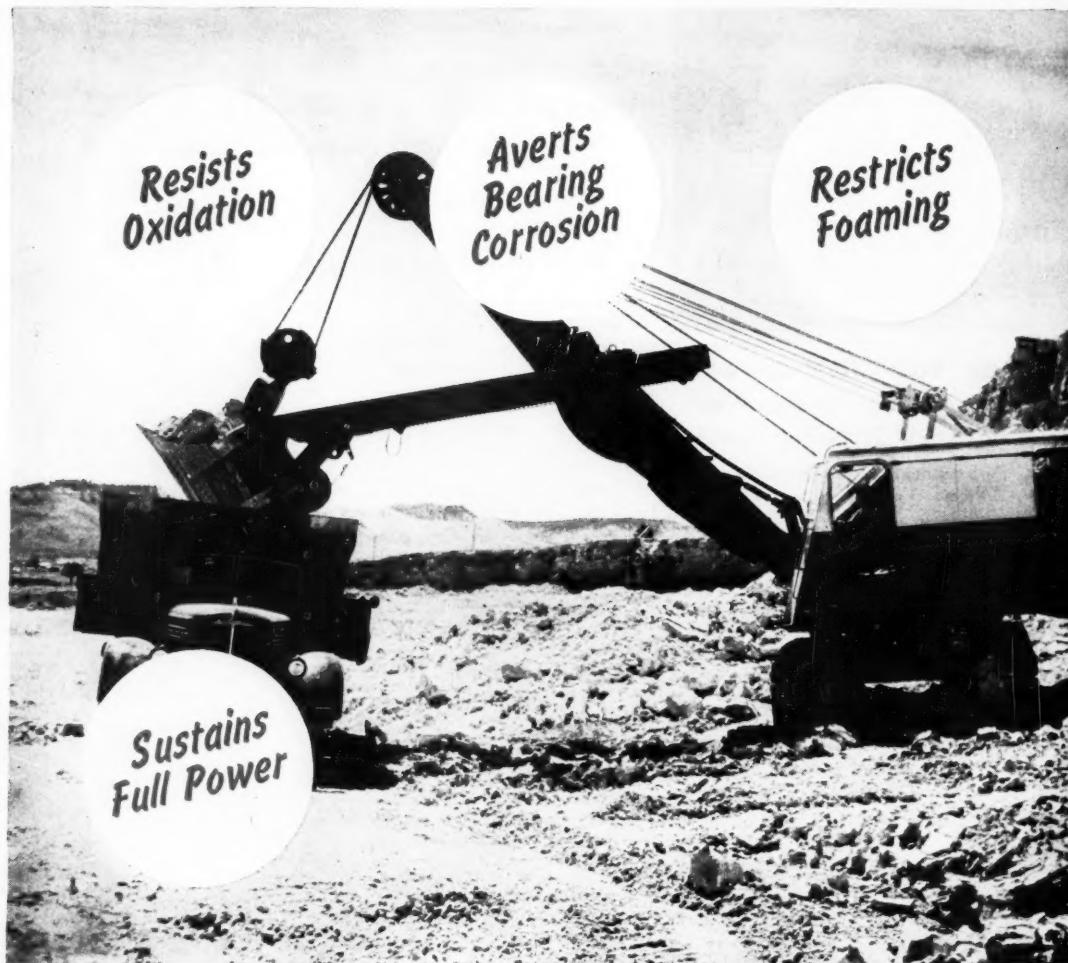
*Reg. Trade-mark

P ARSONS COMPANY

KOEHRING SUBSIDIARY

NEWTON, IOWA

SINCLAIR TENOL Problem in



SINCLAIR

YOUR NEAREST SINCLAIR AGENT WILL GLADLY ARRANGE

Ends Sludging Diesel Equipment



A major problem of diesel engine operation is the formation of sludge, gum and varnish on valve stems, rings and other engine parts, which causes engine drag, increased operating costs and frequent tear-downs.

This problem is solved by the use of Sinclair TENOL for diesel engine lubrication. Sinclair TENOL contains special Sinclair-developed additives to prevent the formation of sludge, gum and varnish. TENOL holds these harmful elements in suspension so that they are drained out with the oil at oil change periods.

Sinclair TENOL cleans as it lubricates, thus increasing time between tear-downs and lowering cost per operating hour. Try Sinclair TENOL in your equipment.



Continual research explains the high quality of TENOL and other Sinclair Oils. Sinclair has recently completed at Harvey, Ill., one of the most modern and complete laboratories for petroleum research and development.



E. W. Isom, Sinclair Vice-President in Charge of Research says: "With the new facilities now made available to us at Harvey, Ill., we expect to find many ways to help industry cut costs through better petroleum products."

HEAVY DUTY LUBRICANTS

FOR LUBRICATION COUNSEL, OR YOU MAY WRITE TO SINCLAIR REFINING COMPANY, 630 FIFTH AVE., NEW YORK 20, N.Y.

For every type of BASE YOUR QUOTATION ON

Here's a profit tip . . . on any job you handle! There's a LaPlant-Choate Scraper engineered to put you yards ahead of schedule. You can finish jobs faster and make higher profits, because LPC Scrapers consistently get bigger pay

FOR
HIGH SPEED,
LONGER
HAULING

BIG LPC MOTOR
SCRAPERS

Here's an earthmoving powerhouse designed to work at high speeds on every earthmoving job . . . in all kinds of material, on level or uneven ground, up and down steep grades. It's the LaPlant-Choate rubber-tired tractor-scraper combination that is big all over—Big capacity permits hauling 17½ heaped yards each trip . . . Powerful 225 H.P. supercharged diesel engine for fast acceleration and extra power . . . Big interchangeable tires for extra traction

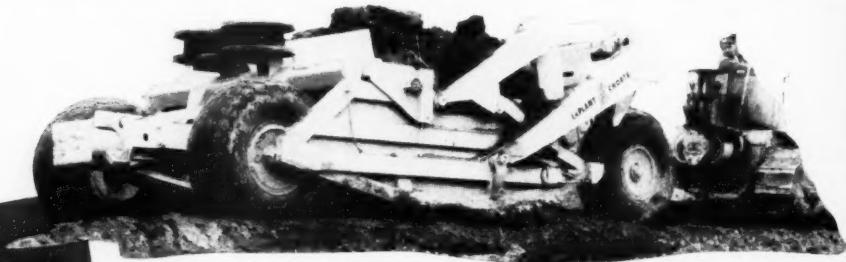
and flotation . . . Big 22" x 7" 4-wheel air brakes for maximum safety.

In addition, these other advantages make the LaPlant-Choate Motor Scraper first choice with operators and contractors alike — Easier loading . . . faster, cleaner, smoother spreading . . . high clearance . . . positive forced ejection. With positive steering, greater stability, effortless operation and easy servicing, the LPC Motor Scraper provides greater comfort and convenience for the operator. In competitive tests, LaPlant-Choate Motor Scrapers consistently out-perform competitive models . . . that's your assurance of greater yardage, faster, at lower cost with this job-proved unit.

FOR
SHORT HAULS
WITH
TRACK TYPE
TRACTORS

LPC
CABLE SCRAPERS

For short hauls with tractors, no other scraper at any price can match the profit-earning capacity of the LaPlant-Choate Cable Scraper. Here are a few of the features that consistently give you the highest average production at the lowest over-all cost—Low, wide bowl for easy loading; modern open-top design eliminates obstructions for convenient loading by shovel or dragline;



positive forced ejection with high lifting front apron for fast, positive unloading under all conditions; low center of gravity and low over-all weight, plus proper weight distribution and proper size tires for maximum flotation, stability and maneuverability; interchangeable parts and tires; easy accessibility for servicing with standard tools.

For the highest efficiency on your particular type of work, LaPlant-Choate Cable Scrapers are sized to fit your needs with 6, 8 or 14 struck yard capacity.

SEE THE LPC SCRAPER BUILT FOR YOUR JOB IN ACTION

Your LPC Distributor will gladly show you all the features that can help you make more money on every project. See him or send your request for literature to LAPLANT-CHOATE MANUFACTURING CO., INC., Cedar Rapids, Iowa, 1022 77th Avenue, Oakland, California.

earthmoving job . . .

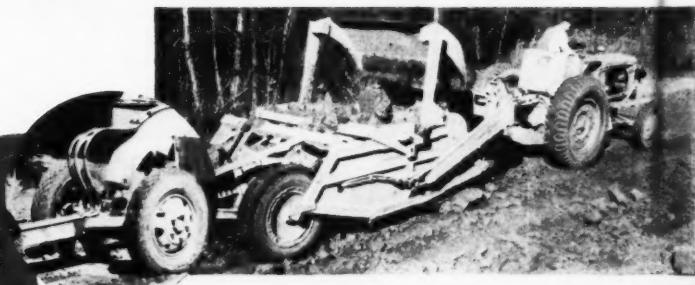
LA PLANT-CHOATE PERFORMANCE!

loads with less power . . . get rid of them faster at the dump . . . cut travel time to and from fills . . . save hours of downtime for maintenance and repairs. Big LPC Motor Scrapers give *big* production . . . more yards at lower cost.



FOR
SMALLER JOBS
WITH INDUSTRIAL
RUBBER-TIRED
OR TRACK TYPE
TRACTORS

LPC HYDRAULIC
SCRAPERS



LaPlant-Choate Hydraulic Scrapers have *all* the features for moving more dirt at less cost. Ideal for ditching and shoulder work, digging stock ponds, filling in and hundreds of other light excavation, stripping, hauling,

spreading and grading jobs. Improved, single-unit hydraulic system provides direct and instantaneous control of bowl and ejector, and down pressure on the cutting edge. Simple, inexpensive adapter assembly allows use of either rubber-tired or track-type tractor.

LA PLANT  **CHOATE**

HIGH SPEED EARTHMOVING EQUIPMENT

NORTH • EAST • SOUTH • WEST • IT'S SCHRAMM!

CHOOSE . . . as others have — THE MODEL THAT BEST FITS YOUR NEEDS!



There's a Schramm Air Compressor, size and model, to meet your specific needs!

Below are listed nine of the many Schramm models, portables ranging from 20 to 420 cu. ft. of actual air, the stationary ranging from 2 to 600 cu. ft. displacement.

On all models performance records are evidence of their high quality. You will find the name Schramm written on every important page in compressor history.

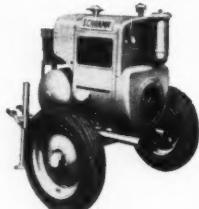
Features you get in Schramm are: 100%

water cooled, assuring ideal performance summer and winter; mechanical intake valve, forced feed lubrication, and electric-starter starting. All Schramms are compact, lightweight, easy to operate.

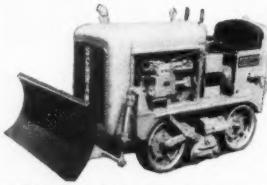
We invite you to write today for fully illustrated catalog describing in detail each of the Schramm Air Compressors shown here . . . plus a wide range of other models. We feel the Schramm story is a good one, and offers you a sure way to get your many compressed air jobs done quickly, efficiently, and economically.

SCHRAMM INC.

THE COMPRESSOR PEOPLE • WEST CHESTER • PENNSYLVANIA



20/35 Model Compressor



Self-Propelled with Hydraulic Backfill Blade



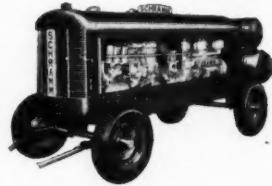
Two-Wheel Trailer Mounting with Tool Boxes



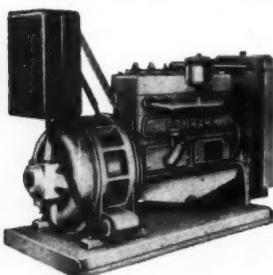
Skidded for Truck Mounting



Truck Mounted



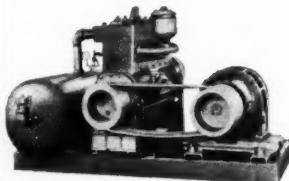
Diesel Engine Drive



Built-in Motor Drive with Cooling Unit and Starter



''V'' Belt on Flat Pulley Drive



''V'' Belt Drive with Air Receiver



Frank Mashuda Company, Portersville, Pa., has the contract to construct a new 12-mile 3-lane section of U. S. Route 422 between Mt. Chestnut, Pa., and U. S. Route 19. The project involves moving over 1,300,000 yards of earth and rock. Gulf quality lubricants and fuels are helping to keep the job well ahead of schedule.

Gulf Products keep equipment rolling

help prevent delays on big highway job!

Frank Mashuda Company is one of many leading contractors who have found that the use of Gulf quality petroleum products insures smooth, dependable equipment performance and low maintenance costs.

Gulf gasoline and Diesel fuel are clean burning, have exceptionally low carbon content, and provide more efficient power. Gulf quality lubricants provide an extra margin of protection—prevent excessive wear that leads to mechanical delays.

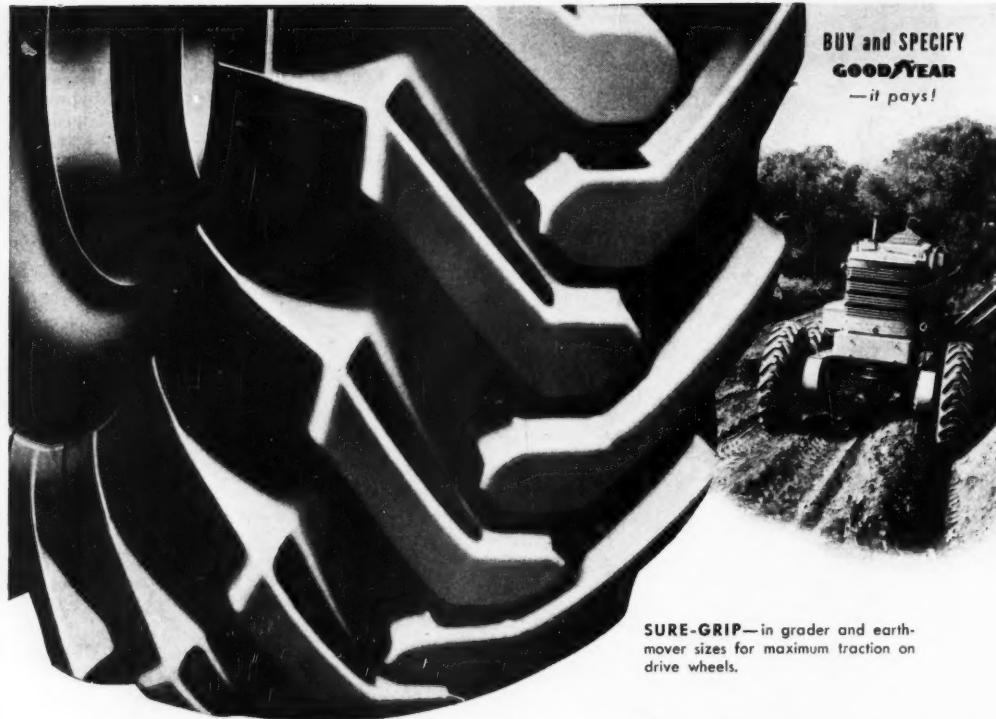
Gulf Lubricants and Fuels team up to help contractors do a speedier, more profitable job!

Gulf Oil Corporation • Gulf Refining Company

Division Sales Offices:

Boston • New York • Philadelphia • Pittsburgh • Atlanta
New Orleans • Houston • Louisville • Toledo





**BUY and SPECIFY
GOOD YEAR
—it pays!**

SURE-GRIP—in grader and earth-mover sizes for maximum traction on drive wheels.

More grip for Graders and Earth Movers, too!

JUST look at that o-p-e-n e-e-n-t-e-r self-cleaning tread and those massive lug bars and you'll see why Goodyear Sure-Grips deliver more traction than other off-the-road tires.

These husky job specialists are first choice with construction men. They give maximum grip, minimum slip—provide super pulling power—low-cost, long-life performance. Another reason why year after year, *more yards are hauled on Goodyear off-the-road tires than on any other kind.*

We think you'll like "The Greatest Story Ever Told"—Every Sunday — ABC Network



Earth Mover All-Weather
for drawn vehicles
and general traction

Hard Rock Lug
for super-stamina
in all rock work

Goodyear Tire & Rubber Company

GOOD YEAR

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND

Construction Methods

Volume 31

FEBRUARY, 1949

Number 2

CUTS AND FILLS

SIGNIFICANT to construction is the record 2.2 billion dollar federal public works program called for by President Truman in his recent budget message. While budget requests must still be turned into appropriations before they become construction expenditures, it is certain many of the projects asked for will be approved by Congress.

THE PROPOSED INCREASE in federal work is one more assurance that construction activity will remain at high level for some time to come. With an 18 billion dollar total volume in prospect for this year, a recorded backlog of definitely-planned projects that hangs around 43 billion dollars despite heavy current contract lettings, and government officials talking about 120 billions in needed public works, construction faces a rosy future.

ANALYSIS OF THE BUDGET requests for construction shows plenty of work in all classes of projects. Even though the Veterans Hospital program was cut back somewhat, there still remains a healthy \$260,000,000 in prospect for this type of building, plus another \$20,000,000 for federal-aid hospitals. The building industry also comes in for some nice work under aviation, atomic energy and military projects. We also can look for some kind of a subsidized housing program.

HEAVY CONSTRUCTION fares mighty well under requests totaling 1.5 billion dollars. That means a whale of a lot of shovels and bulldozers, trucks and scrapers, steel and cement, wire rope and diesel fuel—and man-hours of labor.

HERE'S the budget score board at a glance:

Corps of Engineers: Flood control, \$481,000,000; rivers and harbors, \$217,000,000

Public Roads: \$493,000,000
Bureau of Reclamation: \$356,000,000
T.V.A.: \$49,500,000 (plus \$21,500,000 agency funds)
St. Lawrence Waterway: \$20,000,000
Aviation: \$15,000,000 (plus \$36,500,000 contract authorizations)
Atomic Energy: \$323,000,000
Military: \$203,000,000

AS OUR OLD FRIEND, Spike Hennessey, points out in his soliloquy below: There's work to be done.

SPIKE calls your attention to a new series of articles on construction office procedure, starting on page 40 in this issue. That old construction stiff spends most of his time out on the job, but he appreciates the necessity of job office control. So will you, when you read the articles.

INTER - INDUSTRY COOPERATION is bearing fruit in the matter of coordinating bid openings on large projects to give contractors a chance to prepare estimates. The Associated General Contractors of America, who suggested the plan, represent state, county and local agencies in working with the Corps of Engineers, Bureau of Yards and Docks, Bureau of Reclamation, Veterans Administration, and the Federal Works Agency. Staggering of bid calls for big jobs is resulting in more bids at lowest possible prices.

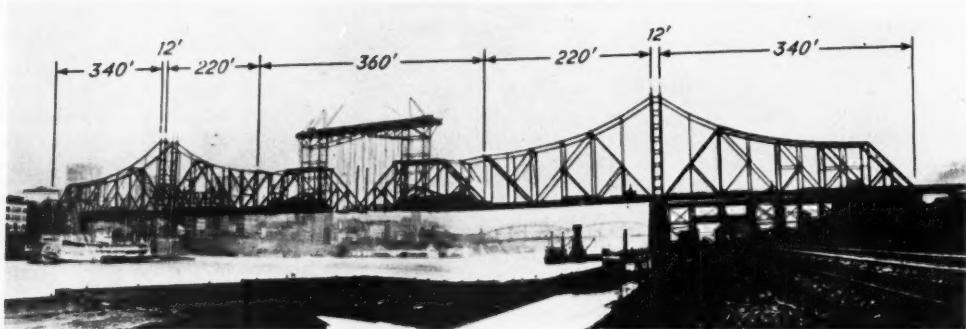
DEVOTING a whole session of the Construction Section, A.S.C.E. to construction engineering education at the annual convention in New York last month, shows the growing interest in this educational activity. Reports showed 59 colleges are now offering 112 courses in construction.



Spike soliloquizes: 'Twas a great speech the President made when he included more than 2 billions for federal construction in the new budget—yep, it's good news for construction. When all those projects get rolling, the contractors, manufacturers, distributors, peddlers and labor gangs will be powerful busy giving Harry the good jobs he's entitled to at reasonable prices. Stir your stumps, Hennessey, ye've got work to do.

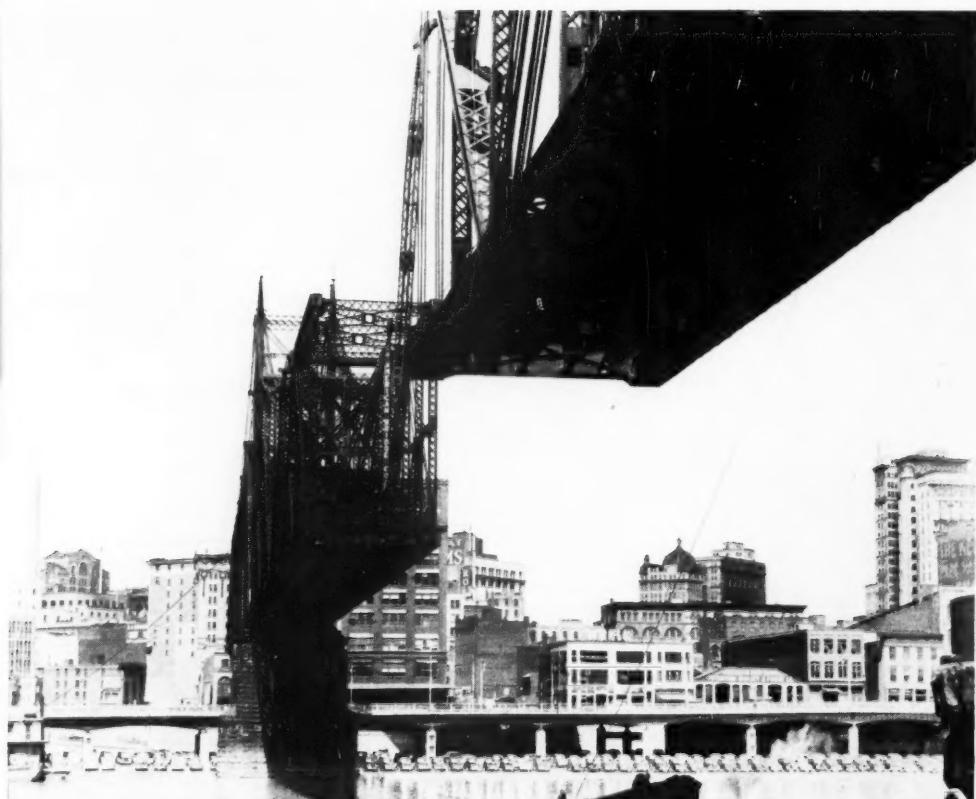
Pittsburgh's Orphan Bridge Comes Down

All photos, courtesy American Bridge Co., Subsidiary of U. S. Steel Corp.



Up She Goes in 1904 . . .

Huge wooden travelers and cumbersome manila rope rigging took 3 years to erect Wabash Bridge 44 years ago.



Down She Comes in 1948 . . .

But two steel travelers and modern flame-cutting methods of dismantling took only 5 months to tear her down.

THERE WAS NO QUESTION as to the present usefulness or potential economic value of the old Wabash Bridge over the Monongahela River in downtown Pittsburgh, Pa., when decision was made for its complete dismantling a few months ago. The old double-track, cantilever bridge had been more or less of a "jinx" ever since its completion in 1904, and it had been rendered utterly useless in 1946 when a fire destroyed the freight terminal it had served.

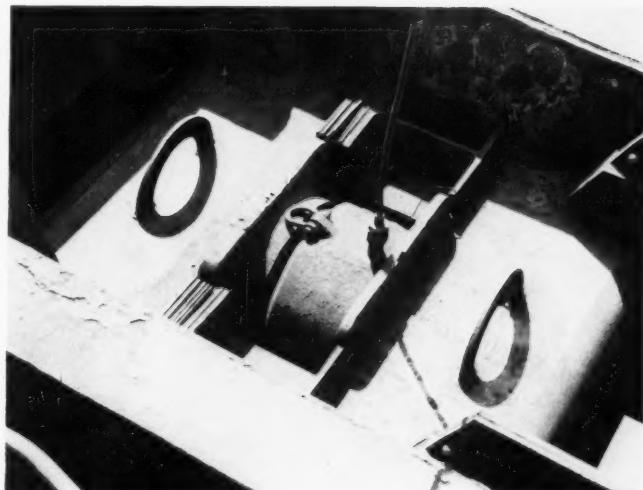
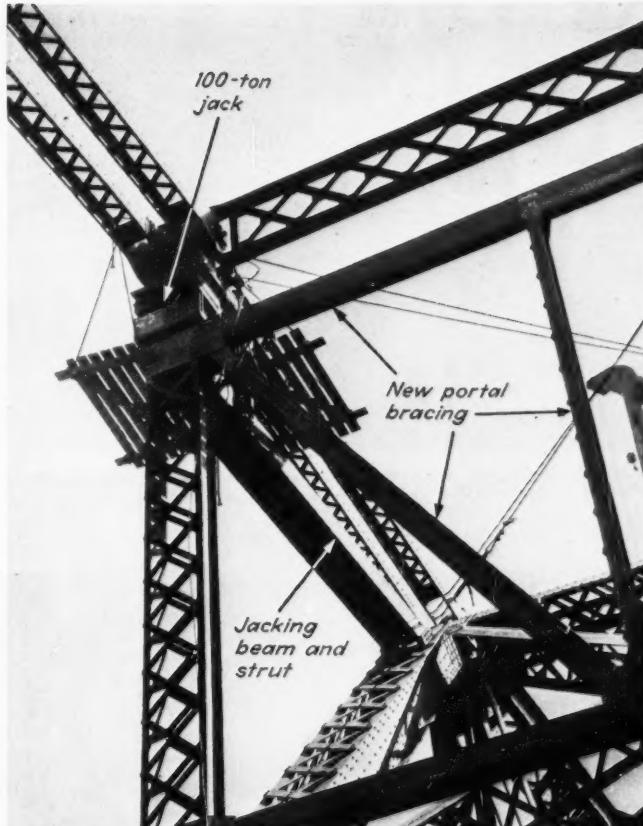
The 45-year-old landmark was dismantled by the American Bridge Co., a U. S. Steel Corp. subsidiary—the same company that erected it back in 1901 to 1904. At the time of its erection, the 1,504-ft. cantilever bridge was notable in two respects. With its 340-ft. anchor spans, 220-ft. cantilever arms, and 360-ft. suspended span, it was the longest cantilever bridge in this country. Moreover, it was the final link in George Jay Gould's multi-million-dollar invasion of Pittsburgh, monopolized at that time by the Pennsylvania Railroad.

Gould, however, failed to find the riches he sought from the first, and the railroad spur—costing \$1,000,000 per mile—failed to be profitable. In 1917 the spur was absorbed by the Pittsburgh and West Virginia Railroad Co., from whom the American Bridge Co. obtained the contract for dismantling the bridge. In 1931 passenger traffic was discontinued on the spur which, however, continued to handle freight until the terminal building was destroyed by fire.

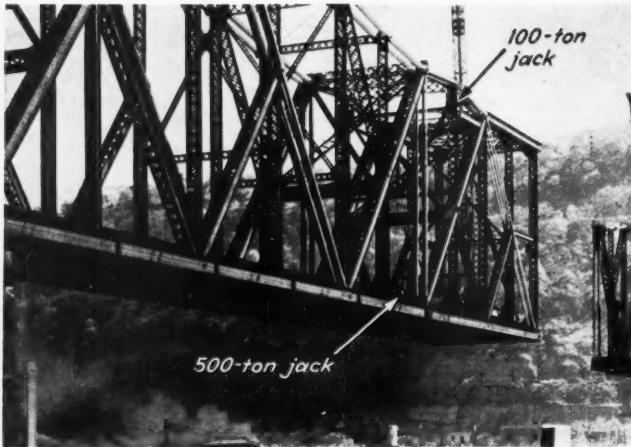
The Wabash Bridge derived its name from the old Wabash Pittsburgh Terminal Railway Co. which, in 1904, succeeded the Pittsburgh, Carnegie and Western Railroad Co. as owners of the bridge.

5 Mo. Versus 3 Yr.

Dismantling operations were conducted in reverse order to the original erection schedule back in 1904. The first cut was made at the center line of the suspended span, with removal of steel progressing toward both abutments. Modern flame-cutting methods, however, together with two steel derrick travelers and a locomotive crane, took only 5 mo. to remove the 8,000 tons of steel involved. By comparison, it took more than 3 yr. to erect the bridge, using timber falsework for the anchor arms and a huge wooden traveler



TOP-CHORD JACKS operate vertically against eyebars connecting pins at cantilever-suspension transition point (at top), while solid diaphragms anchor bottom-chord jacks (at bottom). Note steel shims and H-beam sections for relieving stress from hydraulic jacks



ERCTION IN REVERSE. Stress-relieving jacks at ends of cantilever arms take all the strain, while huge suspended span is cut out and taken down piece by piece.

for the cantilever arms and suspended span.

Before the suspended span was cut at its center, stress-relieving jacking devices were installed in the top and bottom chord systems at the transition points between the cantilever arms and the suspended span. At each of these four points, one 500-ton hydraulic jack was placed in the bottom chord and a 100-ton jack placed in the top chord system. Each 500-ton jack operated horizontally against solid steel diaphragms welded between the flanges of the bottom chord, just inside of the end panel points of the cantilever arms.

The 100-ton jacks operated vertically against the connecting pins of the original top chord eyebar system which tied the suspended span to the cantilever arm. To install each jack, a combination jacking beam and strut was first bolted

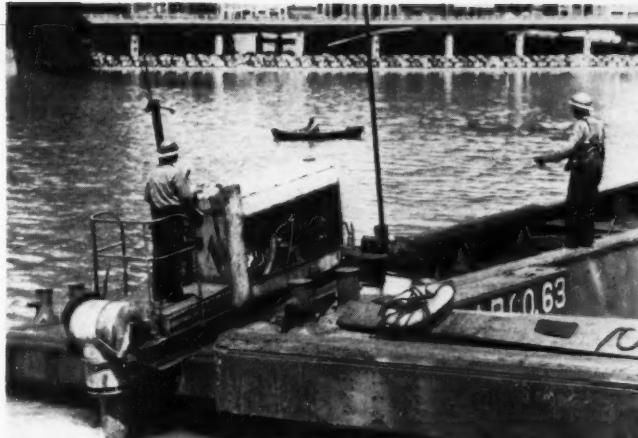


WITH SUSPENDED SPAN out of the way, derrick travelers inch their way shoreward, removing flame-cut members of the cantilever and anchor arms, in reverse order to their erection nearly a half-century ago.

horizontally between the end batter post of the suspended span and an existing sub-vertical post running from the mid-point of this batter post up to the existing eyebar pins.

Two 25-ton hydraulic jacks, seated on the jacking beam operated against the bottom of a vertical post welded to the eyebars to take the dead load stress off of the connecting pins. When this stress had been relieved, the sub-vertical post was cut about 2 ft. 6 in. below the eyebar pins. Bearing plates were welded to the top of this cut member and the 100-ton jack was installed, with suitable shims and connections to jack directly against the eyebar pins.

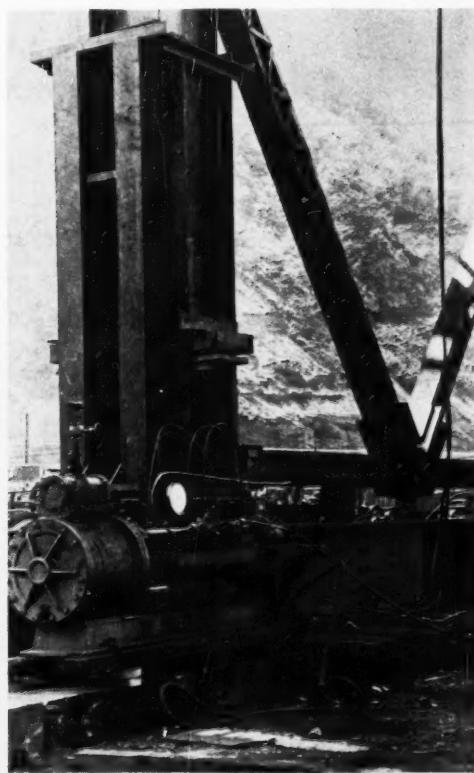
Rigidity of the entire jacking system was maintained by adding a portal-bracing system between the two sub-vertical posts, plus wire rope sway bracing in the



HOME-MADE TUG with 150-hp. outboard unit maneuvers steel barges beneath the bridge to receive the scrap. Tow boats towed scrap-bearing barges to the steel mills.



END VIEW of cantilever arm on north side of Monongahela leaves little wonder that heavy floor system, truss members and wind bracing produced 16,000,000 lb. of sorely needed scrap for U. S. Steel's Pittsburgh mills.



BACK ON SHORE, anchor spans are removed piecemeal while supported on American Bridge Co. standard steel falsework bents equipped with huge hydraulic jacks.

plane of the top chord, at each end of the suspended span.

Hydraulic pressure exerted by the top and bottom chord jacks then relieved all stress at the center of the suspended span. After the span was cut in two at its center, additional jacking opened up the cut to give ample clearance during expansion and contraction of the bridge.

Both travelers, operating on the outside rails of the double-tracks, then moved out within working distance of the center of the suspended span. Each traveler contained a 60-ton, 120-ft. boom stiff-leg derrick operated by 175-hp. Clyde hoists. Derrick rigging was $\frac{7}{8}$ -in. wire rope—13 parts in the boom line and 3 parts in the load line. Heaviest section removed from the old bridge weighed about 25 tons.

All salvaged steel from the old

bridge became the property of the American Bridge Co. Individual members of the trusses, bracing and floor systems were removed by flame cutting, and lowered into barges directly under the bridge as the travelers backed up toward the two piers. A locomotive crane was available for auxiliary material handling while a home-made 150-hp. tug maneuvered the scrap barges at the site. Tow boats pushed the barges to the open hearth furnaces of the Carnegie-Illinois Steel Corp., another U. S. Steel Corp. subsidiary.

Three standard American Bridge Co. steel falsework bents, varying in height from 35 to 50 ft. were needed to dismantle each anchor span, located above dry land. These two-column bents were supported on a grillage of steel beams, in bearing on a mat of 12x12-in. timber mud sills, resting on leveled

areas of the river bank. Columns of the falsework bents were spaced 32 ft. c. to c., to match the truss-spacing in the old bridge.

Two 500-ton hydraulic jacks installed at the base of each column, supported the falsework bents and truss spans as the travelers worked back to the abutments. All members in the anchor spans were flame cut, lowered on to the river bank and loaded into the scrap barges.

The first member was removed from the bridge on April 21 of last year and the job was completed on Sept. 11. Men in charge of the work included: C. W. Doerr, vice-president in charge of erection; John Lowery, manager of erection; D. N. Garner, erecting engineer; H. (Jumbo) Curtis, erecting superintendent; C. Earl Webb, chief engineer; and A. F. MacDonald, engineer on design.

Equipment on Parade



NO SOONER had San Francisco's May Elmer Robinson proclaimed Jan. 9 to 15 Construction Week, than equipment distributors and contractors announced plans for a parade up famous Market Street. Scheduled for the noon hour, the parade gave San Francisco citizens a chance to witness newest machines as caravans consisted of "more than a million dollars worth of heavy mobile construction equipment." The event was sponsored by the Builders' Exchange, an organization of San Francisco contractors and suppliers.

*Cited
for
Service*

HE HAS BUILT WELL, for Adolph Teichert, Jr., has followed in the footsteps of his contractor father, whose brick sidewalks and streets laid 75 years ago are still in use in San Francisco despite passing through the 1906 earthquake. Teichert is head of A. Teichert & Son, Inc., veteran contracting firm of Sacramento, Calif., founded in 1878 by his father, Adolph Teichert, Sr., master bricklayer just arrived from Germany. The Teichert company is the pioneer roadbuilder of the state, being awarded one of the first three highway contracts let by California in 1913. Ever since then they have specialized in asphaltic concrete paving, being responsible for most of such work done in central and northern California.

Adolph, Jr. was born in San Francisco April 24, 1885. Upon graduating in Civil Engineering from the University of California in 1908, he became a partner in his father's business—and has been at it ever since. The son has carried on the father's philosophy: "Honest work never hurt anybody." Hard, honest work is almost a religion with Adolph, Jr.—an effort that has paid out in a successful, highly respected contracting career.

The Associated General Contractors of America will honor this quiet-spoken, hard-working Westerner by inducting him as President of the association at the annual convention in New York City early in March. He has earned this honor by long devotion to

A.G.C. activities and to his industry.

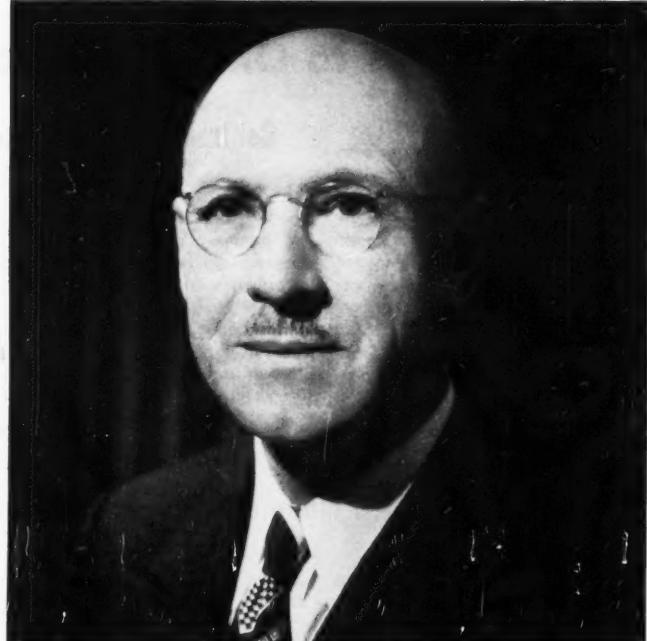
In 1917 his firm branched out into heavy engineering work with a contract for the Sacramento By-Pass Weir. Thereafter he built numerous dams and other heavy projects, including the relocation of the Southern Pacific around Shasta Reservoir. During the war he participated, alone and in joint ventures, in military construction in the West amounting to more than \$45,000,000. Included in this work were air bases, ordnance and signal depots.

Teichert, intensely interested in the younger generation, encourages and helps bright young engineers, both within his company and outside. He believes in starting them at the bottom, but also thinks they shouldn't stay there too long. Therefore, you will find the young supervisors on his jobs given all the responsibility they can take. It seems that he is trying somehow to make up for the loss of his son Frederick, a most promising young construction man

who died in 1944 after being admitted as a partner to the firm. Despite his busy career as a contractor and A.G.C. official, Teichert finds time to head the fund-raising campaign for a new Youth Center in Sacramento. He has long been interested in the local Y.M.C.A.

Besides his devotion to the youngsters, he also feels a responsibility to his community. His civic affairs include the state and local Chamber of Commerce, having served as president of the latter, the Community Chest, the Exchange and Rotary Clubs. Yet he still finds time for regular golf games, his only hobby.

Adolph Teichert's philosophy of honest, hard work will be carried with him into the high office of A.G.C. president. As leader of the general contractors of the country for the coming year he will make no flashy splurges or grandstand plays. But he will work quietly and effectively as a living example of the A.G.C. motto: Skill, Integrity and Responsibility.



ADOLPH TEICHERT, JR.

It Pays to ORGANIZE Your Office

ALL TOO OFTEN construction job office work is poorly organized or even badly neglected. Contractors are prone to devote most of their efforts to getting the outside work lined up, to getting the equipment rolling, to getting the pay items on an income basis—all while the office and paper work suffer from lack of management attention.

Johnson, Drake & Piper, Inc., Minneapolis, with branch offices in New York, Oakland and Terre Haute, is

one big contracting firm that is paying proper attention to office procedure. They have recently prepared an excellent loose-leaf "Manual of Job Office Procedure" that outlines company policies and gives definite instructions to all concerned as to detail steps to be followed on all occasions. The manual is made up of printed

loose sheets in a ring binder to allow for revision at any time.

Realizing the importance of the subject and admiring the excellence of the job done in preparing the manual, *Construction Methods* is proud to publish it in condensed form in installments beginning below, with kind permission of Johnson, Drake & Piper, Inc.

Section 1 . . . BIDDING THE JOB

Plans and Specifications Deposits—Many jobs require a deposit for plans and specifications for bidding. Indicate on check report or invoice whether deposit is refundable, for home office information. The bidding office should keep a record of refundable plan deposits, complete with all pertinent information as to amount, time limit, awarding agency's name and address. Records should be kept of all plans lent to subs and vendors, and their return is responsibility of bidding office. This office is also responsible for return of plans to owner and collection of deposits.

Highway Qualifications—When bidding highway jobs, ascertain if contractors must be qualified (and how far ahead of bidding date), and if so, check with home office to see if we are qualified to bid in that state. If we are not qualified, bidding office will obtain necessary forms (at least 3 copies) and send them to home office for filling out.

Licenses—Some states and other political subdivisions require contractors to be licensed by them. The home office is responsible for meeting such requirements, but the bidding office should also check locally to make sure.

Taxes—Before bidding, learn whether costs will include sales tax, franchise tax, gross income or other taxes in the state where the prospective job is located. In addition to these local inquiries,

consult the home office when bidding in new states; the tax situation will be investigated through the Corporation Trust and the company attorneys.

Performance and Payment Bonds—Rates vary with size of job, so check with the area of home office. Rule of thumb is one percent for combination bond, except highway work, which is three-quarters of one percent. Some government work takes a cheaper rate. If performance bond alone is required, the rate is less.

Insurance—The bidding office in consultation with the area manager, will decide what insurance coverage is needed. The area office will supply rates, obtained from existing policies, from your area insurance agent, or from the home office.

Refer to Addendum III for a list of coverages to be considered, and for an explanation of each. Then read the specifications carefully to learn what the contract calls for. Finally, look the job over, remembering that the work to be performed may cause special insurance needs if there exists drilling, use of explosives, cofferdams, tunnels, etc. Watch for exceptional risk of storms, floods, and other water hazard, needing tailored Marine Builders Risk, Flood and Water Damage.

Labor Rates—When gathering data on labor rates, investigate the existence of any union agreement

(through the A.G.C. or similar group) that applies to the location of the prospective job. Some such agreements cover wide geographical areas. We may sign for one job, and later find it also applies elsewhere many miles away.

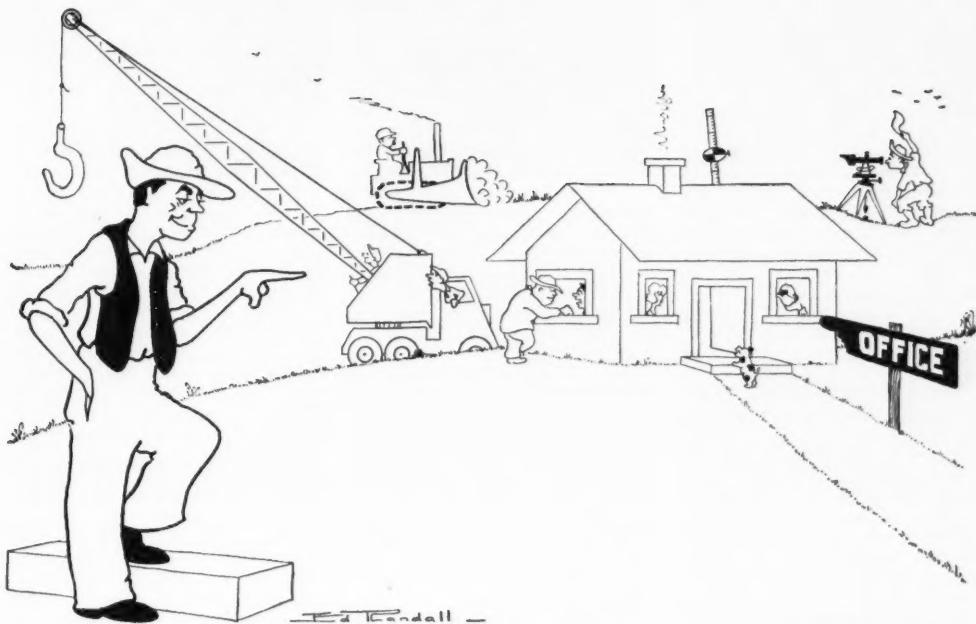
Bid Bond or Bid Deposit—Bid bonds are obtained through Minneapolis, New York or Oakland. The requirements are stated in the advertisements for bids. Get requests in soon enough to make certain the bond is ready in time, even though it may have to be countersigned by a local representative of the bonding company.

On some types of work (notably paving jobs in New York and Pennsylvania), bid bonds are not accepted. Certified checks or cashiers' checks are required instead. Such requirements are stated specifically in the advertisements, and must be followed exactly.

Bid bonds usually cost \$5.00. Deposits are indirectly expensive because they add to the interest expense.

Bidding Kit—It has been found convenient to have a supply of expanding leatheroid wallets made up to take along on bidding trips. These contain supplies needed by the estimators when working in a hotel room. Suggested items:

Blotters; Columnar pads; Envelopes, large manila; Envelopes, 3-cent; Envelopes, airmail; Erasers, art gum; Erasers, regular; File folders; General estimate form; Letterheads, J.D.&P.; Paper clips; Pencils, No. 2½; Pencils, No. 3; Pencil sharpener; Rubber bands; Ruler; Scotch tape; Scratch pads; Stapler; Tabulation sheets; Take-off paper.



Spike sez: "There's the heart of the job. Field office work must be as well organized as my outside operations to make the job click."

Fee Jobs—Sometimes it is of advantage to both the client and ourselves to take work on a fee basis. Submitting of such proposals is the direct responsibility of the area manager. While all of our staff should consider fee jobs where suitable or desirable, do not ever commit the company to any-

thing without specific authority from the area manager.

The company has developed a fine brochure for sales use, containing descriptive matter and pictures about our past work. Special presentations can be marked up from this brochure for any prospective client.

manager ordinarily decides whether he will let the sub-contract himself or authorize the project manager or job superintendent to do so. Letting subcontracts is one of the most important matters in operating a job. After we are awarded a contract, it is sound business procedure to make sure that all subcontract quotations used in our bid are the lowest available from responsible resources. However, certain precautions are necessary. In bidding, an exceptionally low figure is not used if the financial resources and performance ability of the sub are uncertain. The same thing holds true when letting the actual subcontract. If in doubt, request a Dun & Bradstreet report through their nearest office, or through the Minneapolis or area office.

It is the company policy to bond subcontractors whenever any doubt exists as to their ability, integrity or financial soundness. When signing up a sub, request him to pay for the bond himself, even though the subcontract form reads that the general contractor will pay such cost.

On a job which is largely subbed, it is better to take some-

Section 2 . . . STARTING THE JOB

Domesticate — Before signing any contracts, permission must be obtained to do business in a state in which we are not already qualified. The home office handles this, but the area or job office should see that no work actually begins until this has been done. Domestication insures our having access to the courts. We arrange for a legal representative in the state we are entering.

Performance and payment bonds — These bonds are handled through the home office at all times. While it is recognized that sometimes local bonding interests can do considerable good, in many instances, weighty influence is just "talk."

The area manager must usually make the decision in such cases, and his judgment is relied upon.

A performance bond guarantees that the contract will be satisfactorily completed. A payment bond guarantees that all expenses incurred for subcontracts, materials and services pertaining to the contract will be paid.

The federal government has standard forms for these bonds for all their agencies. Some states or subdivisions or private owners will specify the form of bond required. When the bond form is specified, obtain it from the owner and send to Minneapolis.

Subcontract Relations — The area

what smaller profits and be sure of them than to gamble. This is done by careful selection of subcontractors (sometimes even turning down the low figure) and obtaining a bond. The same policy applies to jobs where only a small percentage is subbed, but where a large subcontract may be involved. In general, most of the risk will be eliminated if any part of the job can be subbed to a reliable and bonded subcontractor at close to the cost we figure for doing it ourselves.

Be sure that every sub furnishes certificates of insurance. Lack of these can result in heavy additional insurance premiums.

Our standard subcontract agreement should be used, except where not applicable.

Major Material Purchases—As with subcontracts, be sure that first-quoted prices of materials are the best figure possible to obtain. Certain precautions are customary, and the lowest figure is not always accepted if any doubt exists concerning the vendor's ability or willingness to perform. Here, too, the area manager decides who will do the purchasing.

Equipping the Job — Listing equipment items needed is an important part of making a bid estimate. This is done when the job

methods have been determined.

When a job is awarded, the area manager, project manager, and others will review the job methods, then the equipment list will again be examined. In deciding job methods and the equipment required, certain company policies should be borne in mind. First is that we prefer to own a minimum amount of equipment. This leaves us in a liquid position financially, and flexible as to type of work we can take. Next, avoid purchase of special equipment useful on only one job. If unavoidable, figure on charging the entire cost, less a realistic salvage, to the one job. Third, sell equipment at the end of a job rather than keep it in active storage. Fourth, spending money to get the right equipment is usually less costly than being satisfied with the wrong rig just because we already own it.

Sources for obtaining your equipment are: (1) Available company-owned equipment; (2) Rental, and (3) Purchase. In deciding between rental and purchase, the policies above are considered. Also considered are scarcities, rental prices, length of time to be used, and general company equipment situation. When buying equipment, the purchase order should either be signed by

the area manager, or by his specific direction. When large cash outlays are involved, consult the home office.

Whenever equipment is rented, the agreement should be in writing. Check the rates against the A.G.C. schedule. All rental agreements (unless it is obvious that it will be for just a few days) should contain an option to buy, with rentals to apply on purchase price.

It is company policy to buy standard makes of equipment, and best quality. Keep every piece of equipment in first-class condition at all times. Trade in on new equipment early, before degeneration brings costly repairs.

Obtain at least three copies of instruction and repair parts books. One copy is kept with the machine, one in the job office and one in the area office. Keep a complete identifying record of serial numbers, make, model, capacity, date, purchase price, etc. Furnish a copy to your area office. At the close of each year, send the home office a complete list of all company-owned construction and office equipment at your location. This includes jobs, area offices, warehouses and yards.

Newly purchased equipment should be decorated with the com-

(Continued on page 143)



"Do you have to remind us we're two weeks behind schedule?"



"I said watch the curve, Stupid . . . not the curves!"



NOVEL SIGNS warn motorists of work ahead on highway jobs of Hargrave Construction Co. Red flags and striped braces are additional eye-catchers to alert drivers and call their attention to signs.

Signs Slow Speeders for Safer Roadbuilding

EVER HAVE TROUBLE slowing down motorists passing your highway jobs? Drivers don't seem to realize that life is precious—and so's construction equipment.

To protect their men and machines, as well as the motorists

themselves, Hargrave Construction Co., Cedar Rapids roadbuilder, put flags and flashing lights on all their highway equipment. Digging further into the problem, they came up with these intriguing signs. F. M. Hargrave, head of the

firm, says the signboards caused a lot of comment, that motorists at least saw them. But he's not sure the drivers slowed down.

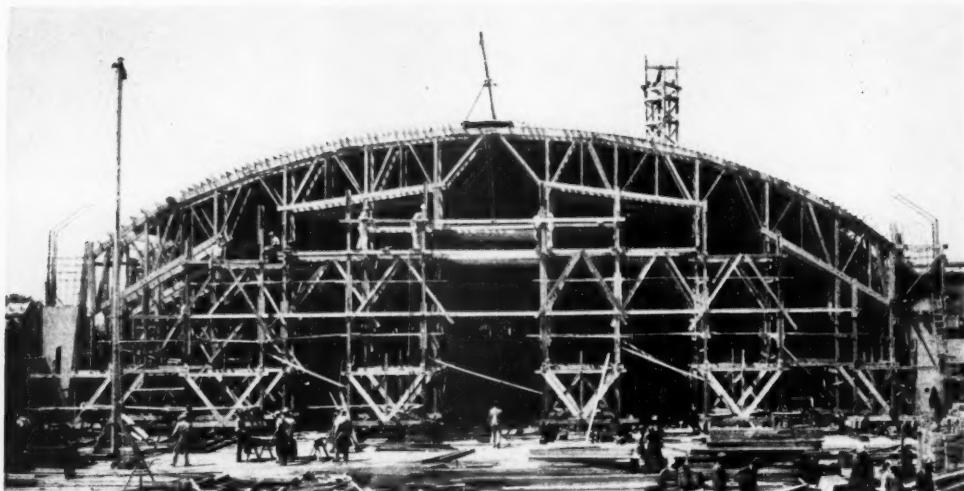
What do you have to do to slow these menaces? Sprinkle the highway with nails?

CONSTRUCTION EQUIPMENT operating on highway carries red flags, or flashing red lights such as these fore and aft on three-axle tandem roller. All machines were later equipped with two-directional flashers. Roadside sign is extra precaution.



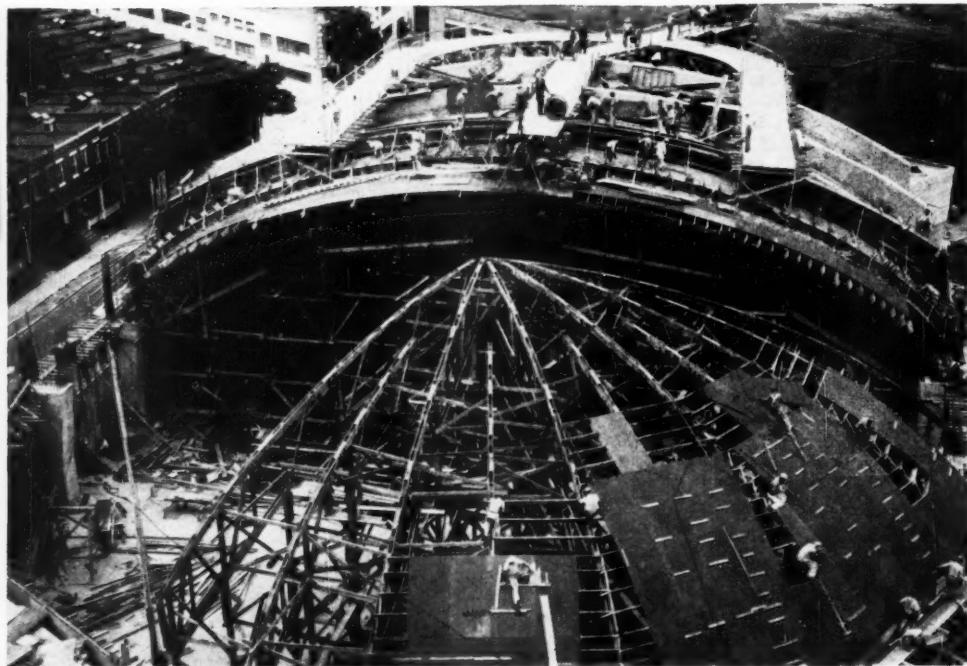
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ROLLING ARCH FORM is built up on second-story floor slab for pouring 131-ft. clear span arch roof for Washington, D. C., skating rink. These forms, carried on six pairs of rails, were used only on center section of roof structure.—Reni Photo

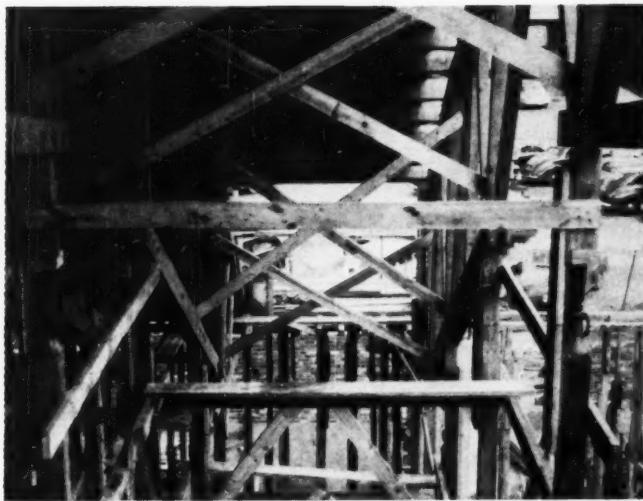
Thin-Shell Arch Roof Poured in Rolling Forms



END DOME FORM (foreground) is built up in segments with timber trusses carried on fixed posts. Here concrete is being poured in rolling form section in center of structure while end dome form, dismantled after use at far end, is being re-erected for second use.

SOME CLEVER FORMS were designed by Charles H. Tompkins Co., general contractors of Washington, D. C., for a complicated combined arch and dome roof of thin-shell concrete over a skating rink in their home city. The building, of two stories and part basement, is 230 ft. long and 131 ft. wide. To provide a clear-span skating rink on the second floor free of columns, the roof was designed as a flat-rise concrete arch of 131 ft. span for the 100-ft. center section, flanked on each end by semi-circular domes. The concrete shell is only $3\frac{1}{2}$ in. thick, carried by exterior ribs extending above top of roof slab.

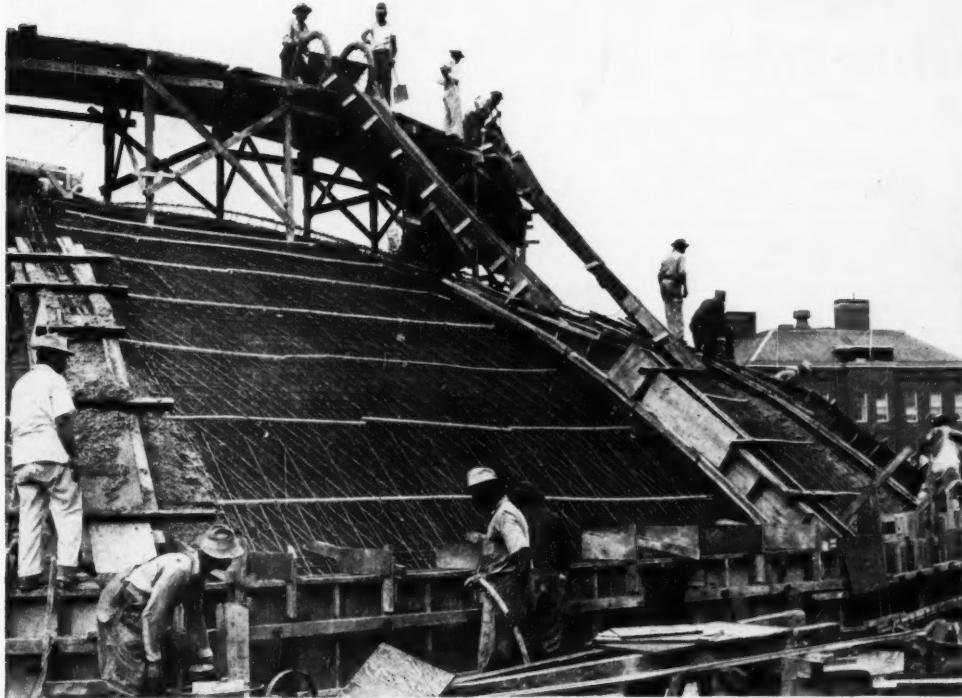
The structure frame was completed first to second floor (skating rink) level, and this floor slab became a working base for the roof formwork. For the center arch section, the contractor designed a rolling form 38 ft. wide, for two $37\frac{1}{2}$ -ft. and one 25-ft. pours, spanning the full 131-ft. width. Six



SCREW JACKS between top of towers and trusses on rolling form sections permit stripping and adjustment to exact grade.

CONCRETE FROM BUGGIES (below) is chuted from runway to end dome forms. Dry mix of 3- to 5-in. slump eliminates need of top forms despite steep slope above spring line. Wood strips

fastened to reinforcing steel are screeds for $3\frac{1}{2}$ -in. concrete shell, to be left in place as nailers for built-up roofing. All concrete, of high-early-strength cement, is vibrated.—Reni Photo



prefabricated transverse timber trusses supporting the roof form were carried on six wheel-mounted timber towers, each riding a pair of rails. The trusses were doubled up under each stiffening rib.

On top of each tower post, directly supporting the trusses above, was a screw jack that served to line up the roof form to exact grade, and also permitted dropping the whole top assembly a few inches for stripping and moving. The trusses carried 2x10-in. joists, 2 ft. apart, to which $\frac{5}{8}$ -in. plywood sheeting was fastened.

Once the rolling forms were in place for a pour, they were blocked up to distribute the load over the floor slab. To ease the load on the floor, temporary posts were installed between floors and in the basement.

The first part of the roof to be poured was one of the half domes at the end. These forms were carried on prefabricated trusses set under each radial rib with shorter intermediate trusses giving additional support at the lower end of the dome segments. Trusses were supported on fixed posts. Joist framing between trusses were covered with plywood as sheeting. After one end dome was poured, the complete form system was dismantled and rebuilt at the other end.

Concrete, delivered to the job in transit mixers, was hoisted in a tower at one end of the building to a runway system built up above highest point of arch rib (see picture on cover). Buggies distributed the concrete to place, with the aid of chutes reaching down to spring line of both the domes and

center arch. A dry mix, with only a 3- to 5-in. slump, eliminated need of top forms even though the slope was fairly steep at spring line. High-early-strength cement throughout permitted forms to be stripped in a minimum of time.

Wood strips fastened to the reinforcing steel served as screeds and, left in place, as nailers for built up roofing. All form sections were poured in continuous operations.

Frank Grad & Sons, Newark, N. J., was architect-engineer. Roberts and Schaefer Co., Chicago, were engineers for the design and construction of the roof. For the contractor, Charles H. Tompkins Co., J. S. Davidson is chief engineer; Patrick G. Caton served as engineer for this job, and Bruce Hutzler was general superintendent.

Special Screed on Grader Paves Gutters

NO USE SHOVELING, spreading and tamping hot mix asphalt by hand into roadside gutters for paving if you can rig up a machine to do it. Therefore, George Herz & Co., San Bernardino, Calif., rigged up a special extension form bolted to the end of the blade of a Caterpillar No. 12 motor grader to do the job on their near-by City Creek Road project.

It's all very simple. The hot mix is dumped in a windrow along the edge of the road from a truck. The regular grader blade then kicks the material into the drain gutter in front of the form. This gadget, with bottom shaped to the gutter contour, spreads, forms and finishes the gutter in one sweep. Herz has a similar rig for shaping curbs where required.



WINDROWED hot mix asphalt for drain gutter paving is bladed to ditch by Caterpillar grader in front of special screed bolted to end of blade.

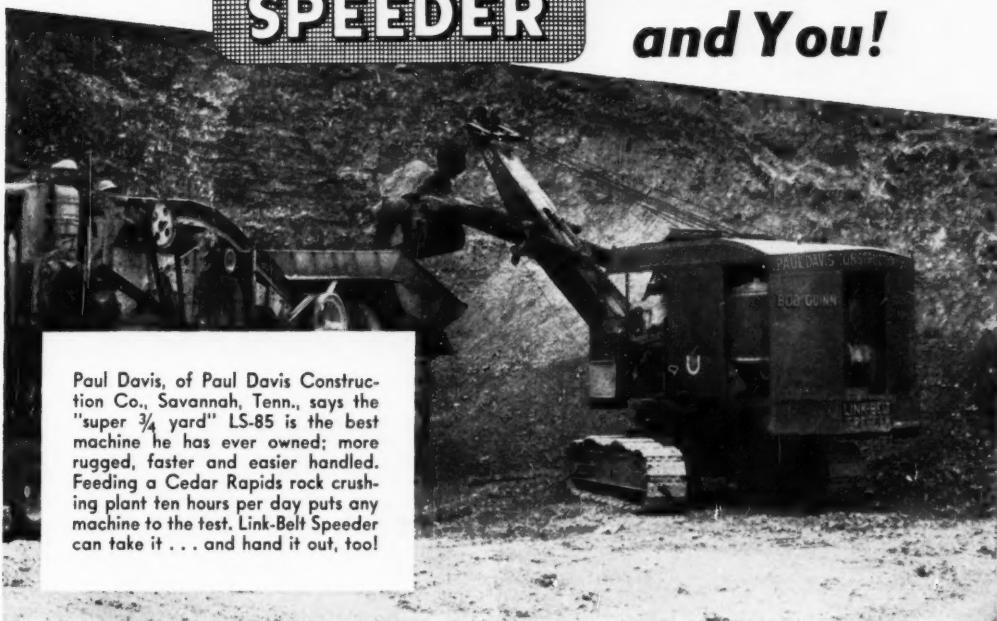


SCREED on end of blade spreads, shapes and finishes hot mix into gutter paving.

There's a

LINK-BELT SPEEDER

**for You---
and You---
and You!**



Paul Davis, of Paul Davis Construction Co., Savannah, Tenn., says the "super $\frac{3}{4}$ yard" LS-85 is the best machine he has ever owned; more rugged, faster and easier handled. Feeding a Cedar Rapids rock crushing plant ten hours per day puts any machine to the test. Link-Belt Speeder can take it . . . and hand it out, too!

BROAD LINE MEETS PRACTICALLY EVERY REQUIREMENT

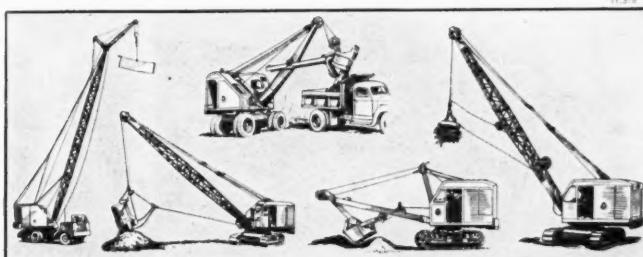
Need a small, nimble, fast-moving, convertible shovel-crane-trench hoe combination for a lot of small jobs? Or a large high capacity dragline for gravel pit or strip mine?—(or something in between?)

The nearest Link-Belt Speeder distributor will show you a line of machines up to 3 yard capacity.

that includes a type and size to suit. All are true representatives of Link-Belt Speeder advanced engineering, long-life, low cost operation. And every Link-Belt Speeder distributor has parts and trained personnel to keep these machines in tip-top operating condition.

Can't you see the money-making possibilities in these convertible Link-Belt Speeders?

Quick, easy convertibility to any of the usual front-end attachments makes the Link-Belt Speeder a multi-purpose machine capable of working at more jobs, more of the time.



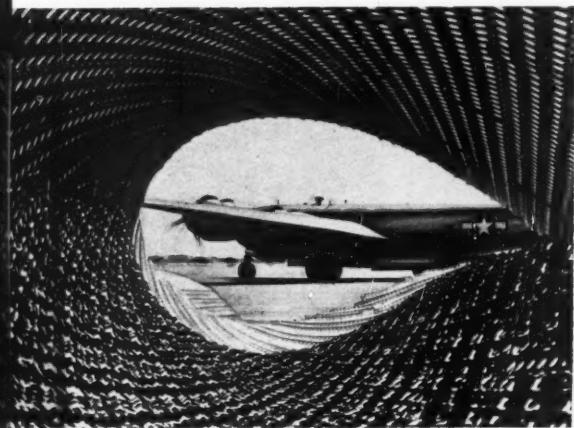
LINK-BELT SPEEDER

LINK-BELT SPEEDER CORPORATION,
CEDAR RAPIDS IOWA



Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

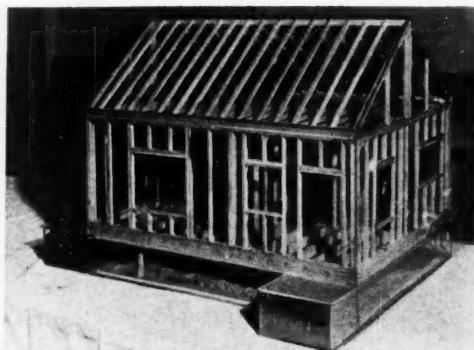
WEIRD oddities



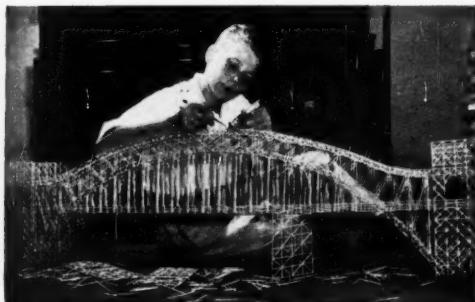
ROLLED UP LIKE A RUG, by cyclonic force of backwash from powerful twin-engined P-82 airplane is this strip of perforated steel landing mat at Hickam Field in Hawaii.—Wide World Photo

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WINTER WONDERLAND SETTING (below) forms picturesque back-drop for Caterpillar diesel motor grader clearing snow from highway near Lake Arrowhead in San Bernardino County, Calif.



TERMITES AT WORK on small-scale wood house framework, enclosed in glass, are exhibited at Chicago convention of National Association of Home Builders by W. B. Hill, of Memphis, Tenn., who has devised built-in piping and toxic chemical spray system to prevent damage to wood by termites.



BRIDGE MADE OF TOOTHPICKS by 14-year-old boy hobbyist BARRY PARISER, of the Bronx, New York City, is 4½ ft. long and requires 35,000 picks for its fabrication. Barry works with flat toothpicks, tweezers to handle them, nippers to cut them and liquid cement.—Wide World Photo



RIBBON-CUTTING to mark opening of new underpass on Bayshore Highway at San Jose, Calif. is done with mammoth scissors, 10 ft. long, here being wielded by WALTER SANDELIN (left), California highway commissioner with an assist from F. W. PANHORST, state bridge engineer.

BUILDING



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SUCCESS in many construction jobs has proved Atlas Duraplastic to be adaptable for all types of structural or mass concrete—for foundations, floors, walls, slip-form, gunite, stucco, etc.

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Your nearest International Truck Dealer or Branch will be glad to send a qualified transportation engineer to analyze your hauling problem, to give you facts and figures on equipment to meet your specific needs, to answer any questions you may have. Call him soon.



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Spike Gets Some Plastering Answers

. . . And Another Problem

STOPPED COLD on his first assignment here, that of explaining why a continuous horizontal crack 4 ft. above the floor appeared and circumscribed a midwestern house-plastering job, our new staff construction expert yelled for help on p. 47, December 1948, *Construction Methods*. His plea was rewarded by several answers . . . and one more problem. Here are three solutions, and the new question:

SAYS A. H. METCALFE, Construction Engineer of Rochester, N. Y.: "Regarding Spike Hennessey's plaster troubles. Location of cracks indicates shrinkage, en masse, of each surface area. With favorable weather conditions, doubling up could have been completed before scratch coat had properly set. Result would be loss of bond at the gypsum base which might not as yet be evidenced. Also contractor could have used wood fiber plaster, although this writer favors hair fibered plaster as a better risk against shrinkage."

SPIKE GETS THIS ONE from John B. Diaguandi of Glen Head, N. Y.:

"The lath under the plaster could be sheet rock or some type of horizontal fiber board. If so, and if there isn't any wire lath on the joints or if the joints are too wide, the plaster would crack.

Your new column is interesting. I hope you will continue it."

FROM WAY OUT WEST comes this opinion from R. J. Welton of Chula Vista, Calif.:

"In answer to the plastering difficulties outlined by Spike Hennessey in the December issue in which

it was assumed both that the background of the plaster was good and that there were no structural defects, I say that when these things happen there is a reason.

If the house is of the ordinary bottom-type framing, it could be that fire stops have swollen with the moisture of plastering, thus causing the crack. Pressure or shock to the studs could be another reason. Still another possible cause (if walls are of masonry) is that blasting might have shaken the plaster.

Wood, swelling and then drying faster than the plaster due to air and heat flowing through them, accounts for most of the cracks above and below the windows.

I have found that closing a room too tightly after plastering will

cause it to heat up, "swelling" the air inside until something must bulge. In a sparsely windowed reinforced warehouse of mine, windows were closed for fear of theft. On the first hot day, the roof slab pushed a crack in a corner of the walls because of expansion.

If the contractor built of frame and braced against earthquake with plenty of metal lath around openings and at junctions of framing timber as we do on the coast, it might eliminate many of these cracks.

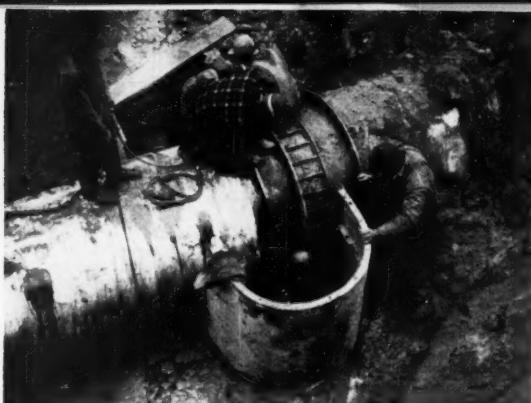
In 50 years of building we have had only a few serious cracks. We have never spared nails and strap iron in framing and have always used reinforcing even in the commonest footings ever since steel reinforcing bars have been in use."



And Here's Another Headache

SPIKE HAS BEEN appealed to by contractor Carl Walters of Church Hill, Tenn., who is having troubles from his workmen smearing up the white plaster coat with dirty hands and clothes, especially around doors and stairways. Anybody got any good ideas on how to remove the smudges without injuring the white coat or splotching the walls? If you have, Spike would sure like to hear from you. Just address him in care of the Editor.

HOW ...they did it

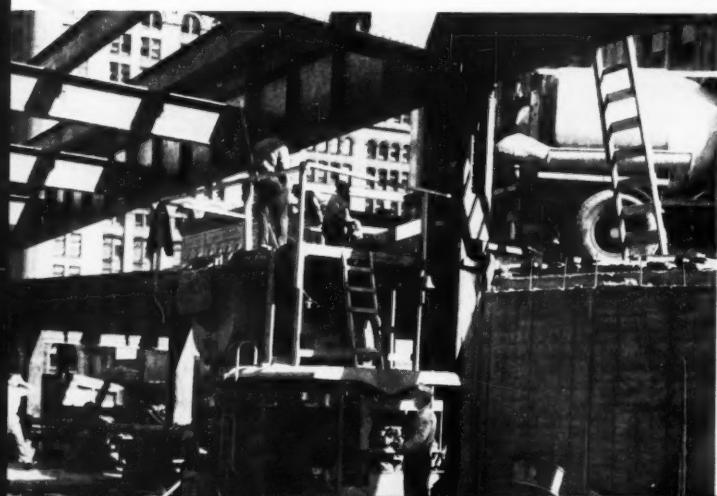


PROTECTION OF WORKMEN from injury by earth slides in deep cut for 55-in. steel conduit at Syracuse, N. Y., is afforded by using U-shaped section of sewer form to shield joint on which men are working.



CONTINUOUS CONCRETE PAVING on U.S. Route 70 in Oklahoma is aided by mounting on trailer, which moves alongside paving mixer, huge water tank of 2,000-gal. capacity. Tank, regularly serviced by water truck, kept mixer supplied with water at all times, enabling it to operate steadily throughout day. Tank was equipped with two pumps, one to feed paving mixer and other to transfer water from tank-truck.

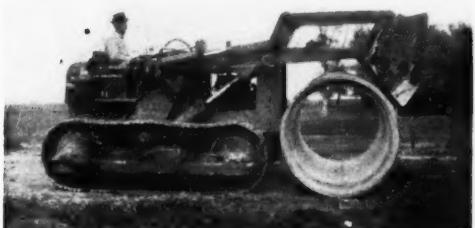
TO POUR DECK on extension to New York City's West Side Elevated Highway (below), P. T. Cox Construction Co., Inc., pumps concrete from street 25 ft. below. Rex 200-Double Pumpcrete is mounted alongside approach ramp leading to upper deck so transit-mix trucks can deliver concrete directly to machine's re-mix hopper. More than 5,000 cu.yd. of air-entrained concrete for six-lane divided highway is pumped maximum of 1,000 ft. horizontally and 30 ft. up.



FOR SUBGRADE EXPLORATION prior to pressure grouting of track, Chicago, Burlington & Quincy R.R. used this power-driven portable 6-in. earth auger. Electrically-operated drill is supported by block and tackle from lightweight aluminum tripod. Power is supplied by small 3-kw. gasoline engine-driven generator.

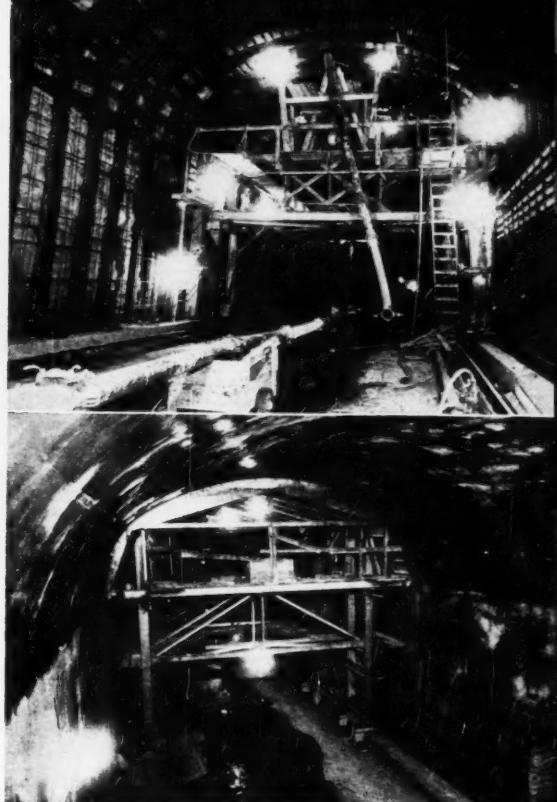


MOBILE WELDING SHOP for railroad maintenance work is designed and equipped for New York Central R.R. by Davey Compressor Co., of Kent, Ohio, for building and maintaining frogs and switches and for welding rail ends. Built around Davey heavy-duty power take-off, outfit consists of generator and 300-amp. welder, 1,000 ft. of welding cable, surface grinder and oxyacetylene cutting torch, all mounted in 2-ton Chevrolet truck. Power take-off transmits power directly from truck engine to generator and is controlled by shift lever in driver's cab. Truck tows trailer for three-man operating crew consisting of welder, grinder and flagman. Removable tracks at rear permit grinder to be wheeled directly on to rails.



PRECAST CONCRETE PIPE for culvert at Waterloo, Iowa, is trundled to place by Allis-Chalmers tractor-shovel. Tractor rolls pipe and holds it in line with shovel dipper.

FOR SETTING CONCRETE POSTS along roadway on 10,000-ft. South Dam of Columbia Basin project, near Coulee City, Wash., two specially designed time-saving devices were developed by Sparling Steel Co., Seattle and Spokane, subcontractors for installation of 1,600 concrete posts. A U-shaped lifting device, at left, handles 400-lb. posts and pin-connected welded-steel pipe spacer at right center places posts on 12½-ft. centers. General contractor for \$2,771,000 dam now nearing completion is Bair-Crick Co., Spokane, Wash.



SEPARATE TRAVELERS, moving on wheels along tracks with wide clearance to permit passage of equipment, carry Blaw-Knox steel forms for concrete lining of sidewalls (top) and arch (bottom) of Pennsylvania Railroad's Saltsburg (Pa.) Tunnel 2,660 ft. long, 30 ft. wide and 28 ft. high, being built to relocate tracks in area of Conemaugh flood control project of U.S. Engineers in Pennsylvania. Concrete is delivered to forms by pumping through pipeline. Contractor is Herman Holmes, of Crystal Falls, Mich. In operation, sidewall form traveler is followed by arch form traveler to provide for concreting 60-ft. lengths of tunnel at each setup. Forms for each 60-ft. setup are stripped, moved and reset in 1½ hr.



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FAST FULL LOADING Exclusive double-curve blade produces full loads quickly, distributes load evenly, lowers horsepower requirements for loading, breaks up chunks and reduces voids, loads more pounds of dirt per cubic yard.

FAST SMOOTH HAULING Scraper is pulled at drawbar level. Big low pressure tires, same size all around, stay on top even when going is soft. Rolling resistance is low because wheels are mounted on anti-friction bearings and flotation is equalized.

FAST STABLE TURNING High-streamlined gooseneck and ample distance between front post and bowl frame provide plenty of clearance for front tires. Low center of gravity provides exceptional stability. Low fairlead sheaves eliminate tendency to tip the scraper over with winch lines.

FAST CLEAN DUMPING Exclusive two-section apron can be adjusted to provide opening that suits material being loaded. Positive rolling ejection gets rid of load fast. Exclusive torque-rod speeds return of bowl to loading position.

B-250

22 cubic yards (struck)

B-170

15 cubic yards (struck)



S-113

10 cubic yards (struck)

S-91

8 cubic yards (struck)

S-68

6 cubic yards (struck)

S-46

4 cubic yards (struck)

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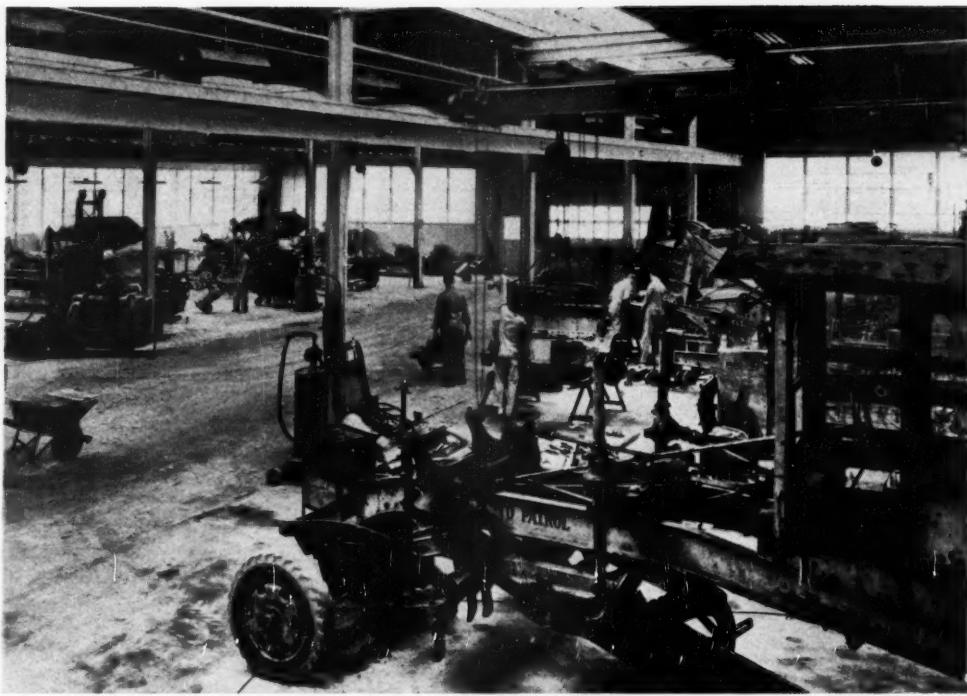


B-TYPE 15 and 22 Cubic Yard



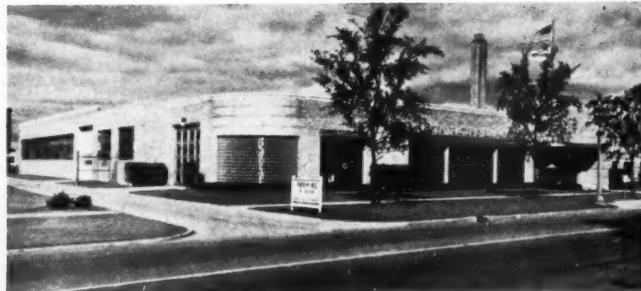
S-TYPE 4 to 10 Cubic Yard

Industrial Tractor Distributor



REPAIR of construction equipment is a professional job when done by distributors. Patten Tractor & Equipment Co., Chicago, uses this well-equipped large shop to keep its customers' machines rolling. Auxiliary shops are housed in outlying buildings.

EQUIPMENT MAINTENANCE: Distributor Gives Specialized Service



BEHIND this imposing front are Patten showroom, offices, parts departments, main shop, full injector and magneto repair room, shipping and receiving departments. Built since war, this modern plant is a fine example of services offered by equipment distributors.

MOST DISTRIBUTORS are experts in construction equipment maintenance. They have the knowledge, the shops and tools, the parts supply and the necessary trained personnel to do the right kind of repair work that will keep equipment operating efficiently.

Outstanding among the many fine service facilities set up by distributors are those of Patten Tractor & Equipment Co. at Bellwood, Ill., a Chicago suburb. Patten, distributor for Caterpillar, Athey, Trackson, Hyster, Case and allied products in northern Illinois and Indiana combine the office, shops, display room and parts department

in a splendid new plant that includes every modern facility for selling and servicing construction equipment.

The Patten company follows certain rigid rules in that they repair and service only equipment made by the firms they represent, they insist on using only genuine parts furnished by the manufacturer, and they confine their service to their sales territory. Besides doing a mighty business with contractors, they also do a lot of work for railroads, utilities and big industrial firms. Besides repair activities, the shop is responsible for assembling and delivering new machines and attaching accessory products both to old and new units. They also inspect all new units after 30 days' use.

Patten officials report a continuing trend toward distributor services due partly to a shortage of parts and skilled mechanics. However, the manufacturers are building more and more precision into equipment, requiring special tools and increased mechanical skill for repairs. This, Patten believes, is mostly responsible for the steady increase in distributor service business, which exceeded \$200,000 last year in this company.

Patten employs 35 mechanics in its service department. From five to six men are always in the field, manning special repair shop trucks. Two men are welders, one of them is a specialist on layout. Fuel injection work requires two men, a third in the same separate room devotes full time to magnetos and generators. There is one specialist in each of the following categories: Radiator, steam cleaning, painting, crawler tracks, and toolroom dispenser who also grinds valves, bores cylinders and repairs heads. The remainder are general mechanics. Two foremen direct the shop activities.

Well-Equipped Shop

The Patten Co. is set up to repair and service every part of every machine they handle, except tires. As they do not sell tires, they feel better service can be given by the rubber companies. Four completely-equipped repair service trucks are constantly in the field. In the main shop, consisting of 12 20x40-ft. bays, are lathes, drill presses, hydraulic presses, overhead and jib cranes, AC and DC electric welders, automatic



PARTS ITEMS for shop repairs come from these well-stocked warehouses adjoining shop. Above is receiving and storage area for larger items. Small parts are stored in neatly-tagged revolving bins below. Good service to customer depends upon ample supply of parts. Patten reports availability of items is much better than any time since war, and is improving fast.



FIRST STOP for items headed for repair shop is cleaning house, where combination of pre-soaking in cleaning compound and diesel oil, high-pressure water jet treatment, and steam cleaning, shown here, prepares units for easy and quick repair. High-pressure water treatment that removes mud and dirt cuts cleaning time in half.



RADIATORS are a vulnerable equipment item and always need maintenance. In a separately housed shop, Patten cleans cores by boiling in a heated caustic solution (left), then repair all leaks by careful flame soldering, as shown at right.

cutting torches, and a full supply of special tools supplied by the manufacturers. This last item includes fuel injection and magneto apparatus. Included in the hydraulic presses is a 125-ton rig for straightening bulldozer blades.

Compressed air outlets are mounted on every column.

Adjoining the main shop, located in the same building as the offices and display room, are the tool crib, fuel injection and magneto room (glass inclosed), the parts

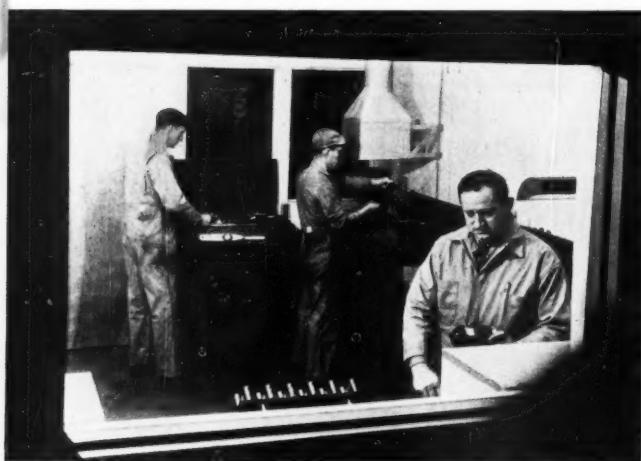
department, shopping and receiving departments. Two men are furnished by the parts department for handling items requisitioned by the shop.

Outlying buildings house the remaining service departments. All machines and sub-assemblies coming in for repairs are given a thorough cleaning in the wash rack and cleaning house. Here, in addition to a complete Turco steam cleaning outfit, is a Curtis high-pressure water jet operating at 400 psi. that knocks mud and dirt loose and cuts cleaning time in half. A pre-soak tank, filled with a solvent mixed with diesel fuel oil, also aids cleaning. Patten is convinced that money spent in cleaning is more than paid back in full by reducing repair time.

A special radiator shop contains two 5x5-ft. heated boiling tanks and complete brazing equipment.

All outgoing repaired equipment is run through a 23x40-ft. paint shop equipped with spray painters and exhaust fans.

An unusual setup is a track-pin press room, equipped with a traveling power wrench for unbolting and assembling crawler tracks, a pin press and a novel track winder that rolls up the



UTMOST PRECISION is built into fuel injector and magneto assemblies, in order to handle these delicate items properly. Patten inclosed a special shop with glass to keep out dust and moisture. Three men are kept busy on this type of work.



CRAWLER TRACK dismantling and assembly are speeded up by this traveling power wrench. Track shop, separately housed, also contains pin press and handy power gadget for rolling up repaired track stiff with new pins and bushings.

tracks by power after insertion of new, tight pins.

The accompanying pictures show many of these features. Patten Tractor & Equipment Co. is a splendid example of the well-



LAST STOP for all repaired equipment is this fan-ventilated paint shop where a coat of paint spray is applied to give all units that new look.

equipped shops and service facilities offered by distributors to keep construction equipment rolling.

B. C. Patten is president of the company. Other executives include: Ralph S. Patten, vice-presi-

dent and general manager; George Doering, secretary-treasurer; Harold L. McCormack, service manager; E. C. McAllister, sales manager; and J. J. Jordan, parts manager.

Grandstand Seats for the Big Show

SIDEWALK SUPERINTENDENTS in Detroit, Mich., view construction on the new Veterans Memorial Building from a deluxe observation platform furnished by Kuhne-Simons Co., general contractor. What's more, the Memorial Hall Commission has issued membership cards on which is printed, "Bearer is entitled to discuss progress of Detroit's Civic Center."





It's better to KNOW beforehand!



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**MOVE IN ON *More Profits*
with a mobile
LORAIN TL-20
MOTO-CRANE**

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For here's a bundle of brute energy that stays put only when there's work to be done. Traveling on its rugged rubber-tire mounting the TL-20 Moto-Crane "sprints" from job to job at highway speeds up to 30 M.P.H. And with interchangeable boom equipment, this "quick-change artist" can perform equally well as a shovel, crane, clamshell, dragline or hoe.

Actually, in the TL-20 Series there are a total of 50 possible combinations available, from which you can select the exact machine—in boom and mounting equipment—to match your job conditions and insure greater production and consistent profits. Contact your Thew-Lorain distributor for money-making details on this extremely usable unit.

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TL-20 FEATURES

Unit Assembly—Easier Service
Interchangeable Parts
5 identical Clutches
Anti-Friction Bearings
Oil-Enclosed Cut Gears
Lights (Standard)
Starter and Generator (Standard)
Independent Rope Crowd Shovel
Choice of 9 rubber-tire mountings
or 2-speed chain drive crawler
Complete interchangeability
of 5 booms

Lorain

Thew
TL-20
Lorain



Rakers and Struts are Shimmed Tight as ...

Prestressed Bracing Holds Sheetpile Wall

BRACING SUPPORTING sheetpiling along a busy San Francisco street was given an initial stress to prevent movement while foundation excavations were made for a 22-story building. This system was devised as the sheetpiling served as one form for the outside wall of the basement and also because any ground movement would damage the street and underground utilities. This prestressed bracing system was developed by forces of Ben C. Gerwick, Inc., subcontractor for sheetpiling, under Swinerton and Walberg Co., general contractor for the 22-story addition to the Standard Oil Company of California building.

To form the foundation wall

along the 69-ft. frontage on the building addition, a row of sheetpiling was first driven. The building site was then partially excavated, leaving a berm of undisturbed earth against the sheetpiling. Then the concrete mat footing was poured up to within 31 ft. of the sheetpiling.

Diagonal raker timbers were placed between a 12-in. WF steel wale on blocks on the mat footing that were cast specially for the purpose. These 12x12-in. timbers, spaced 9 ft. apart, were prestressed by 35-ton jacks working against a bracket, bolted to the timbers.

Ground in the 31-ft. wide area between the sheetpiling and the mat footing was then excavated

down to top of the 8-ft. deep footing. Next, to further brace the sheetpiles, a row of 14x14-in. timber struts was placed in a horizontal position bearing on the concrete blocks and on a 12-in. WF bottom wale. In this manner, the thrust on the sheetpiling from the street side was effectively resisted.

After the horizontal timbers were placed, the excavation was completed and the mat footing poured up to the sheetpiling. Then the horizontal bracing was removed and a 12-in. basement wall poured against the sheetpiling up to the diagonal bracing. Bracing then was placed against this wall and the diagonal bracing just above removed. This permitted the

wall to be poured up to street level.

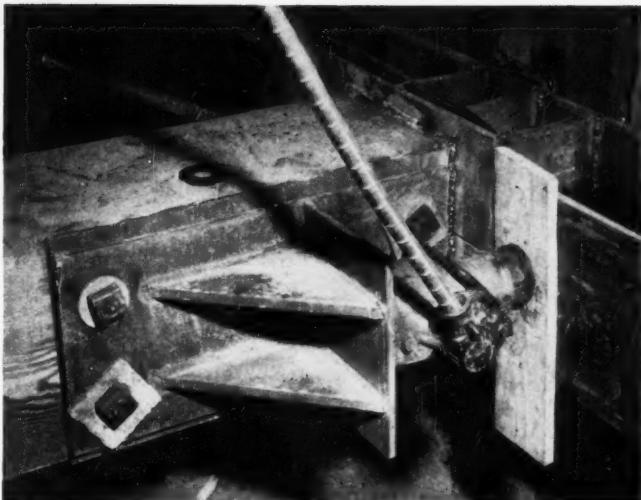
The third set of bracing was left in place until the street-level floor slab was poured further to support the basement wall. Spacing of the timbers was somewhat irregular to permit erection of steel columns.

Two 35-ton Duff-Norton screw jacks were used to prestress each timber. Special brackets mounted on each side of the timbers transmitted the load from the jacks to the timbers. Five sets of these brackets were used.

On the diagonal timbers, the jacked open gap between the timbers and the concrete block formed by the jacking was filled with dry-packed grout. This stiff mixture was pounded in with mallets. The jacks were left in place for 2 days until the grout had set.

For the horizontal bracing, time did not permit use of the dry-pack method. Instead, steel shims were welded in place and the jacks then removed.

Careful measurements taken



HEART OF PRELOADING of bracing for sheetpile wall on San Francisco building foundation is pair of 35-ton screw jacks. Here is jacking system set up for prestressing a horizontal strut. Jacks bear against brackets bolted to strut and push against steel wale that has been reinforced with diaphragms at strut bearing points. After load has been thrown against strut, space opened up by jacks between timber and wale is filled in with steel shims, as shown here welded to sideplates on strut.



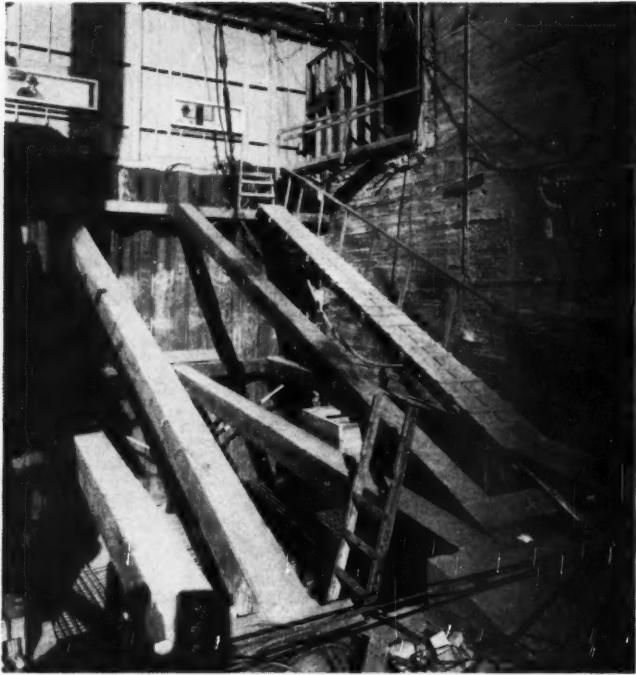
AFTER JACKS have been removed, steel shims, already welded to timber strut sideplates, are welded to steel wale to tie bracing assembly together.



CONNECTION between top of inclined rakers and upper wale is welded plate and angle assembly bolted to timber. Jacking for prestressing rakers is done at lower end of inclined bracing.

INSIDE ENDS of both struts and inclined rakers bear against concrete kicker blocks on top of previously poured footings. Filler for opening between jacked raker and block is dry-packed grout instead of steel shims as used on horizontal struts. Prestressed and grouted raker is shown here beyond horizontal strut.





during the work indicated less than $\frac{1}{8}$ -in. horizontal and vertical movement of the street curb during the work. This was in spite of the movement of heavy truck-mixers bringing concrete for the footing.

This work was done by forces of Ben C. Gerwick, Inc. for whom Bill Talbot was superintendent. General contractor is Swinerton and Walberg Co., C. H. Brown, superintendent. H. A. Thompson and Aleck L. Wilson are architects and H. J. Brunner is structural engineer. Standard Oil Company of California is represented by E. P. Wright, manager of the building design and construction department.

◀
ELEMENTS of complete prestressed bracing system are shown here. Horizontal struts are wedged at wale end with steel shims after jacking; inclined rakers are grouted against kicker blocks at lower end. Notice gallery for sidewalk superintendents above sheeting.

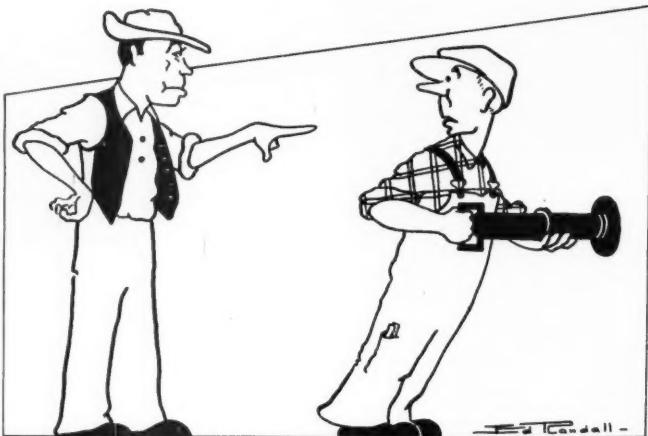
Powder-Actuated Tool Accidents? ... Not on Spike's Job



THAT OLD construction maestro, Spike Hennessey, is instructing a workman on the proper use of the powder-actuated stud fastening gun. He's taking precautions against possible accidents.

Another fatality has been reported from use of this type of tool. Here is a new and useful construction aid, into which the manufacturers have built absolute safety so far as the gun is concerned. Yet, careless use of the tool may result in serious accidents. Supervisory management must take the responsibility of seeing that men handling the tool are properly instructed as to its safe use and operation.

Take a tip from Spike and play safe.



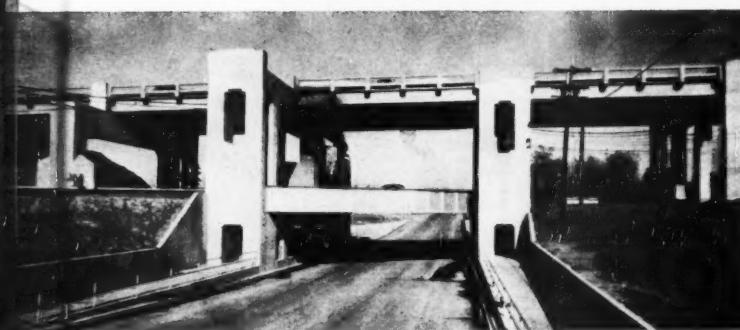


REQUEST FROM **BYERS**

RAVENNA, OHIO OR YOUR NEARBY BYERS
EQUIPMENT DISTRIBUTOR



ERCTION OF STRUCTURAL STEEL for 13-story 1,000-bed Veterans Hospital on former Bamberger Estate, Newark, N. J., was started Jan. 5 by Harris Structural Steel Co. under direction of Col. W. W. Wanamaker, New York District Engineer, Corps of Engineers, U. S. Army. Building requiring 6,000 tons of steel will be of H-shape with over-all dimensions of 370x370 ft.



THREE-LEVEL RAILROAD-HIGHWAY INTERCHANGE at intersection of U.S. Routes 13 and 460 near Norfolk featured last year's \$32,000,000 construction program of Virginia Department of Highways. A highway ramp and main line of Norfolk & Western Railway pass on center level.

SERVED BY 1,662-FT. CABLEWAY (below) carrying floodlights for night-time operations, Narrows Dam—Corps of Engineers' flood control and power project on Little Missouri River in Arkansas—passes 30 percent constructed mark, with completion set for January 1950. First-stage diversion was by concrete cofferdam wall (foreground), while concrete plant on far bluff includes a complete refrigeration system and an electric batching and mixing plant. Contractors are Arundel Corp. and L. E. Dixon Co.



BIGGEST CRANE ON RUBBER—Not on its way to move the Washington Monument (background) but merely comprising a part of the Corps of Engineers' construction equipment display during the presidential inauguration, is this newly-developed 65-ton Lorain MC-820 Moto Crane. Said to be the biggest crane on rubber, it can hoist 45 tons at 12-ft. radius, using outriggers. Top road-speed is 17 mph.—The Shovel Co. Photo.



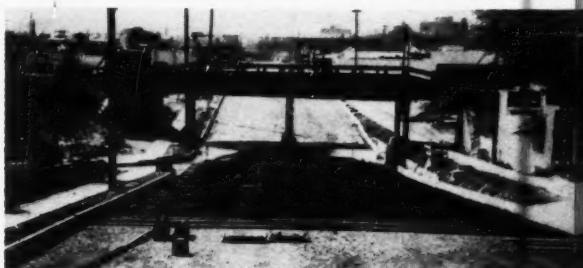
DEEP-SEA DRILLING for oil is proving profitable to Humble Oil & Refining Co. at their new million-dollar drilling platform 8 mi. out in Gulf of Mexico. First hole hit a salt dome but second one brought in 900-bbl. well. Hole number 3 is now being drilled.



HOTEL FOR PILGRIMS IN ROME during Holy Year (1950) is being constructed near St. Peter's. Building of 400-bed capacity will also be used for offices of Catholic Action organizations. View was made from Castle St. Angelo.—Wide World Photo



NEW \$20,000,000 SKYSCRAPER, portrayed in huge sketch, is planned for easterly blockfront on Park Ave. from 40th to 41st Sts., New York City, on site of old Murray Hill Hotel. Viewing sketch of 36-story office structure to be called One Hundred Park Ave. are left to right: LOU R. CRANDALL, president of George A. Fuller Co., general contractor, ELY JACQUES KAHN, of Kahn & Jacobs, architects, and LOUIS ADLER and S. D. LEIDESDORF, respectively president and chairman of board of 100 Park Ave., Inc., sponsor of project.

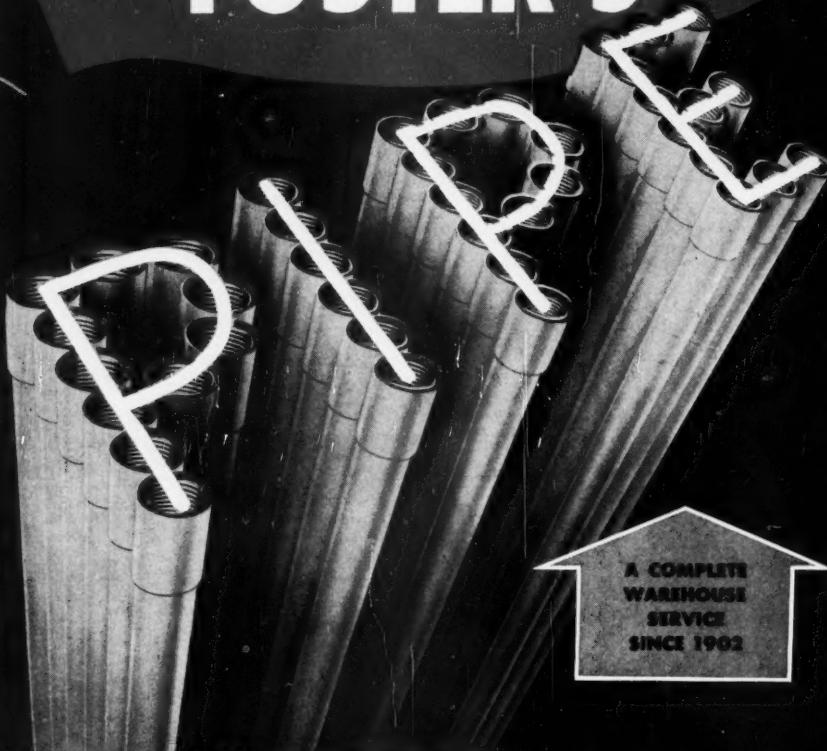


RADIANT HEAT to insure snow-free driveways is becoming rather commonplace, but here is an installation on whole section of steep-pitched street in Klamath Falls, Ore. Operation costs will be nothing, for warm water from natural hot springs will be circulated through pipe coils during icy season.—Acme Photo

WORLD'S BIGGEST DIPPER—Even Paul Bunyan would be impressed by this giant rig (below) stripping 45 cu.yd. of overburden per minute from Hanna Coal Co. strip-mine near Cadiz, Ohio. Chief claim to fame is its new 45-yd. modified armor-plate dipper developed by Marion Power Shovel Co., which tops by 5-yd. big Marion dipper introduced to coal-mining industry 2 yr. ago, yet weighs no more when loaded than 35-yd. loaded dipper developed 3 yr. ago. Dipper is mounted on Marion-built model 5561 shovel which can reach out 2/3 of city block and could dump its load on top of 7-story building.



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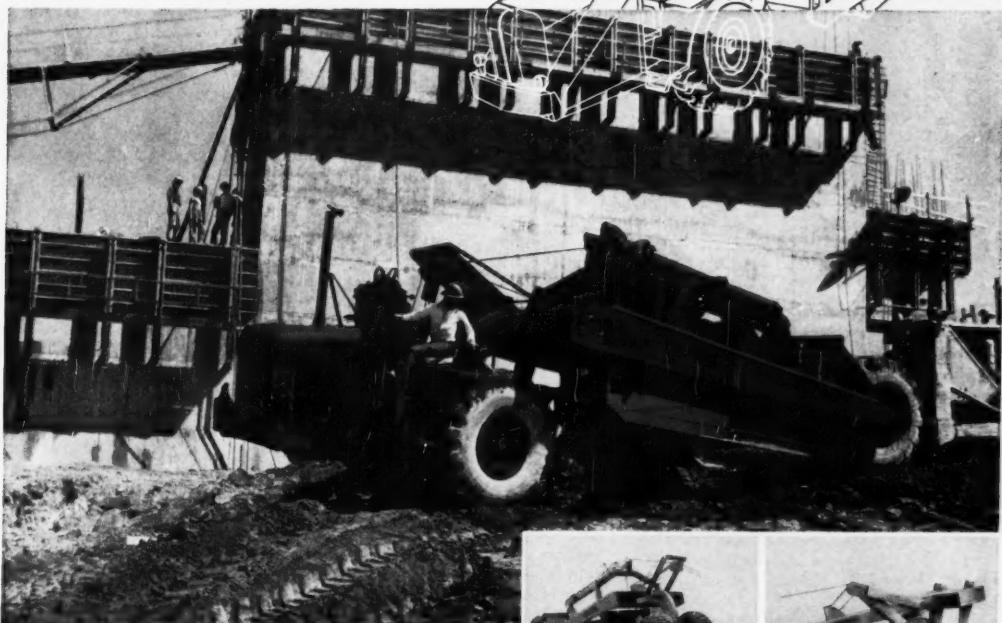
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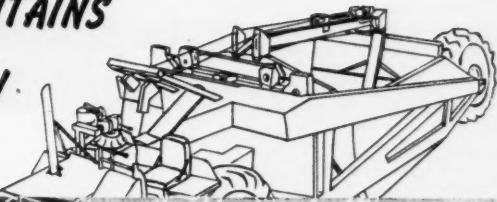
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Above: One of a fleet of Wooldridge Terra Cobras back-filling at the Angostura Dam on the Cheyenne River.

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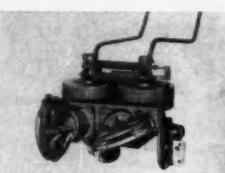
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LEGAL ADVENTURES OF TRACTOR CONN

By LESLIE JOBB



By recounting the experiences of Tractor Conn, who symbolizes the average contractor, this series of articles, each based on the decision of an American court and presented in plain, non-legalistic terms, is designed to help construction men avoid costly legal pitfalls.—Editor

The Case of the Waterless Well



Tractor Conn had branched out into a new field and was negotiating a contract to dig a deep well.

"Your price seems O.K.," the owner agreed. "But I must have at least 500 gallons of water per day out of the well."

Conn had a bit of the gambler about him and agreed.

"I'll dig your well and it will give you your 500 gallons."

A contract was drawn up with the usual legal embellishments and signed.

Conn set up his equipment and started drilling. In course of time he struck water and the flow was more than adequate to meet the owner's demands.

"That's fine. I'm perfectly well satisfied," the owner announced as he paid Conn his contract price, and they parted happy.

It was only a matter of a few months when Conn had a heated telephone conversation with the now irate owner.

"That well you dug for me has almost gone dry." "That's too bad, I'm sorry, but what do you want

me to do about it?" Conn asked in what he hoped was a soothing tone of voice.

"Fix it, or do something," the owner barked.

"I can't do that, but I will dig you another well in another location at the same price," Conn offered.

"You'll dig me one for nothing. I've got your name on a contract that says my well will give 500 gallons of water per day and I'm going to hold you to it even if I have to go to court," the owner threatened.

Tractor Conn was quite safe, however, as the courts have decided that "under a contract to dig a well which shall supply a certain quantity of water, the law will not imply an agreement by Tractor Conn that the supply will continue without failure."

One case that lays down this rule is, Wunsch v Boldt, 4 Tex. A. Civ. Cas. 50, 15 SW 193.

The Case of the Waterless Well

Tractor Conn had misjudged a job and his expenses were running well ahead of his contract price. To add salt to his wound, his bid on another project had been accepted where he was dead certain to clear a pretty penny. Making a hasty decision, Conn abandoned the first job and started work on the second.

It was only a matter of time before the justly provoked owner stormed into Conn's office and demanded an explanation.

"I completed your job," Conn explained with a straight face. "Now, all I want is my money."

"Completed my job," the owner exploded, "why, there isn't a door in the whole building. Here's a list as long as your arm of things that haven't been done."

"I contend it is completed," Conn insisted.

"And I contend it isn't. I'll go to law," the owner threatened.

And to law they went. The owner proved that the work was not completed and Conn did not contest this evidence.

However, Conn attempted to prove that a reasonable length of time had not elapsed in which to finish the work.

The Judge listened patiently to Conn's argument but decided, "that after once abandoning the work Tractor Conn could not make that claim," and gave the verdict to the owner.

A parallel case is Clifford v Richardson, reported in 18 Vt. 620.



More Legal Adventures of Tractor Conn Next Month

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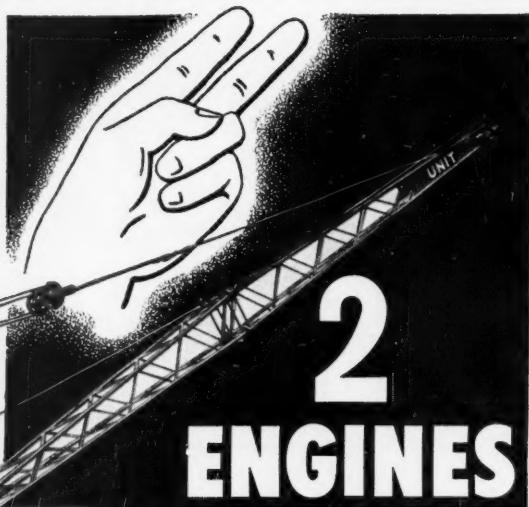
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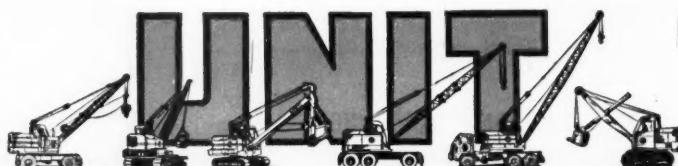
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reverse. A road speed of up to 32 M.P.H. makes "going from job to job in a hurry" a simple matter. Large diameter, wide-faced air brakes are used on all 4 rear wheels. A hand operated, shoe type parking brake is provided on the propeller shaft. A short turning radius increases its value in close-quarter operations, and all dimensions meet highway requirements.

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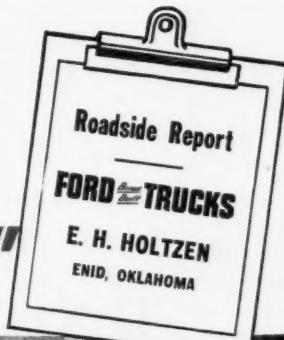
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Gross Vehicle Weight Ratings: F-8 up to 21,500 lbs., F-7 up to 19,000 lbs. Gross combination ratings: F-8 up to 39,000 lbs., F-7 up to 35,000 lbs.

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McGraw-Hill Surveys BUSINESS NEEDS

If it can get the money American industry in 1949 will go full steam ahead with a vitally-needed program of improving its facilities. This program since V-J Day has kept business expanding and has made belated headway in modernizing industry.

Furthermore, if it can get the money American industry will carry on for the next five years with its unprecedented program of expenditure for new plant and equipment. Plans already made call for spending about \$55 billion.

These are findings of the McGraw-Hill national survey of "Business" Needs for New Plants and Equipment." Major results of the survey, which have been rechecked since election day, are summarized on the following page. They report what American industry is now planning to spend for new plant and equipment. *They do not and cannot show what will be done if the plans are hamstrung by political action.*

In 1949, the survey shows, American industry plans to spend \$14.1 billion for new plants and equipment. That is only about 5% less than was actually spent in 1948.

If these plans are carried out, actual capital expenditures this year may be somewhat larger than they were in 1948. That is because expenditures usually prove to be larger than planned.

Fulfillment of American industry's plans for investment in new plant and equipment this year would no doubt mean a continuation of general prosperity. The record shows that when capital expenditures are high general business thrives.

Even more remarkable than the 1949 prospect is the fact that:

Industry already plans to spend \$41 billion in the years 1950-53 to improve its plants and equipment.

Plans tend to taper off, of course, as they are pushed further into the uncertain future, five years from now. But the striking fact is that plans for expenditures so far ahead are as great as they are. They show American in-

dustry's need for tremendous improvements in its plants and equipment.

Again, let there be no mistake. These survey findings are not a five-year forecast. They report what leading corporations now are planning to do — *if they can get the money.*

But — won't industry be top-heavy with plants and equipment if it carries through any such program?

The answer is clearly — "No".

Here are some of the reasons why not that were disclosed by the McGraw-Hill survey:

First, manufacturing industries are shifting emphasis from expansion to improving efficiency.

They have increased their total capacity 56% since 1939. Their expenditures in 1948 went almost 50-50 for expansion and improvement. But in the next five years they plan to spend three-quarters of their funds to replace and modernize facilities, only one-quarter for expansion.

Second, the prospective rate of expenditure for new plant and equipment is relatively low.

Planned expenditures for new plant and equipment in 1949 represent about 7.5% of the present value of all plant and equipment. That rate of capital expenditure is no higher than the rate during previous periods of prosperity. And industry must overcome years of starvation for new equipment, caused first by the depression of the 30's, then by diversion to war production.

Third, industry is following an extremely cautious policy in buying new equipment.

Three out of four companies report that they will not buy equipment unless it will pay for itself within five years. And a third of the companies report that they expect new equipment to pay for itself within three years. The reason most frequently given for such expectations was that all the money available can be spent on equipment which does pay for itself quickly.

The program of capital expenditure planned by American industry is one of the greatest bargains ever offered to the American people.

To pay for itself in a few years, as equipment must if most companies are to consider buying it, that equipment

continued on next page

WHAT THE SURVEY SHOWS

● HERE ARE THE MAJOR FINDINGS of McGraw-Hill's survey of "Business' Needs for New Plants and Equipment". Rechecked since Election Day, results show what industry is now *planning* to spend for new plants and equipment. They do not forecast what will actually be spent. The survey shows:

1. Industry now plans to spend \$14.1 billion in 1949—and almost \$41 billion in the four years beyond, 1950-53.
2. Manufacturing industries alone plan to spend \$7.2 billion in 1949. This is 7.5% of the estimated value—\$96 billion—of all manufacturing facilities.
3. Manufacturers estimate conservatively that it would cost \$136 billion to completely replace their facilities with the most modern plants and equipment available.
4. Postwar expansion is virtually complete in most manufacturing lines. Major exceptions: steel and petroleum refining.
5. Expansion programs of railroads, utilities, and oil companies still have two to five years to run.
6. Manufacturing industries have increased their capacity 56% since 1939. But expansion is slowing down. Increase planned in the next five years is only 13%.
7. Efficiency is emphasized more and more in planning new facilities. Manufacturers plan to devote almost three-quarters of their funds to replace and modernize. In 1948, 58% went to increase efficiency this way.
8. Equipment should pay for itself in five years or less, say three out of four manufacturing companies. New buildings, say 77% of them, should pay out in 15 years or less.
9. Profits and reserves are counted on to pay for new buildings and equipment by three out of four manufacturing companies. Some 15% expect to borrow, only 9% plan to sell stock. However, 20% would like to sell stock, only 4% want to borrow.
10. More liberal depreciation allowances for income tax purposes would prompt almost two-thirds of the companies to speed their purchase of new plants and equipment.

● A copy of a complete report on "Business' Needs for New Plants and Equipment" may be obtained by writing me at McGraw-Hill Publishing Co., 330 West 42nd St., New York 18, N. Y.

must promise to produce much better products or make great savings in labor and material. The savings go first to the companies buying the equipment but, as they always have, they soon spread to everyone in the form of better products at lower costs.

Where does industry expect to get the money to buy this bargain for the American people?

Most of the companies covered by the McGraw-Hill survey (76% of the total) count on their own resources—largely profits—to pay for new plant and equipment. About 15% of them expect to borrow money, although only 4% like the idea of getting saddled with fixed debt. Only 9% of the companies expect to sell stock to investors, although twice that many report they wish they could.

What are the chances that business can get the money?

The survey provides no answer to that question. No survey can.

The answer will come from Washington—in what Congress does about taxes on profits and taxes on the millions of Americans who might invest a part of their income in industry's new plants and equipment.

The answer will be found also in the energy and skill shown by investment bankers, particularly in mobilizing the resources of the millions of Americans whose incomes have increased enough since 1940 to make them potential direct investors in industry.

Still another important part of the answer will be given by labor leaders. About half the companies surveyed by McGraw-Hill are holding back on new construction—primarily because of high costs. What organized labor does about wages and productivity can swell or shrink that percentage.

The McGraw-Hill survey leaves no doubt that Ameri-

can industry is fulfilling its responsibility. It is planning the capital improvements needed to make the nation secure, prosperous, and progressive.

But business today lacks confidence and badly needs added incentives. Proper taxation and increased depreciation allowances are vital if we are to open the capital markets to finance industry.

What will happen now depends in large part on what is done in Washington. In his State of the Union message, the President said that "business should plan for steady, vigorous expansion." But in his budget message he proposed new taxes which would divert a substantial share of the money industry is using for expansion and improvement. Moreover, he said nothing about the vital issues now freezing the capital markets.

It is not possible to have it both ways. Fulfillment of the President's tax program means cutting industry's program for new and better equipment. It means slowing down industrial progress. It means delaying the advance toward much higher standards of living tomorrow in order to have a little more government spending today.

I urge you to see that your Representative and your Senator have all the facts on industry's needs for new plant and equipment. What they do to this program will have a decisive bearing on the nation's security and welfare.



President, McGraw-Hill Publishing Company, Inc.

This is the fourth editorial of a special series on industry's needs for new plants and equipment—and what these needs mean to all Americans.



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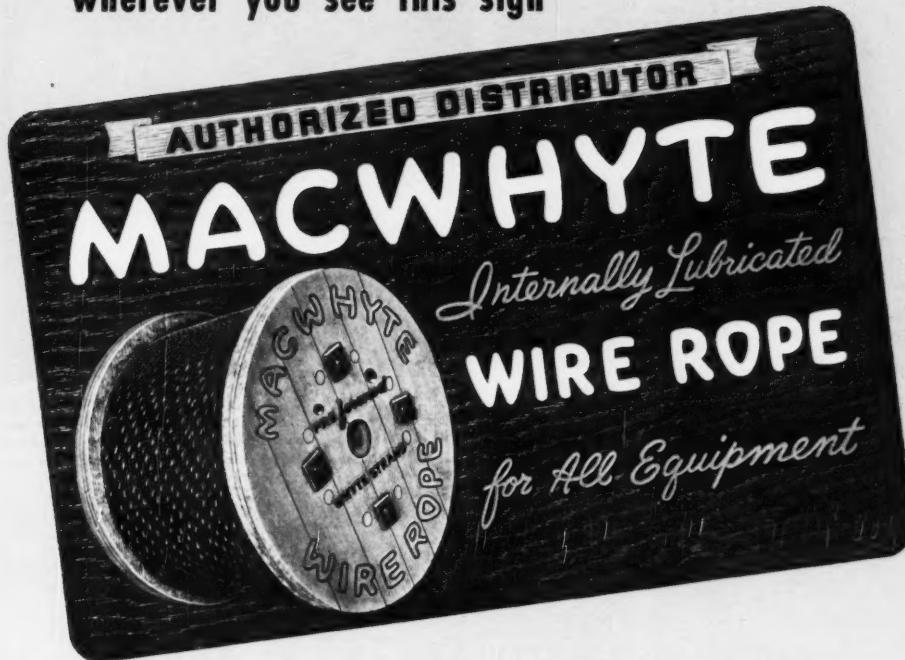


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SOMETHING NEW in radio station antenna is FKI's 750-ft. tower in California built up of solid steel rod legs and braces welded into 20-ft. sections which are bolted together through foot pads.

HIGHEST RADIO TOWER west of the Rocky Mountains and the third highest in the country was recently fabricated by the International Derrick and Equipment Co. of Torrance, Calif., and erected at Buena Park, Calif., by the Skyway Construction Co., of La Habra, Calif. The uniform section, welded rod, guyed, vertical radiator-type antenna is 750 ft. high. Its construction and erection involve the application of arc welding.

To improve reception of its AM signal and extend its range of operations radio station FKI replaced an old 400-ft. T-type antenna with this modern 750-ft. vertical radiator type. This type of radio tower, in addition to be-

ing more efficient, can be fabricated faster and cheaper and erected higher because the freedom afforded by arc welding in the choice of materials permits the use of solid steel rod. The solid rod construction is stronger than any other type of construction. It offers less wind resistance and requires less ground area for erection. The economies in design thus achieved result in reduced cost of construction.

The total weight of the tower is 104,740 lb. It is erected by bolting together vertically thirty-seven 20-ft. triangular sections made of 4-in. mild steel solid rod for legs and 1 3/8-in. rod for bracing. The 20-ft. sections, with legs spaced



FIRST STEP in fabrication is welding each end of 4-in. solid leg unit to 1 1/2x14-in. foot pad in jig with two-pass welds. Four legs, fabricated into square tower section with welded solid bar bracing, make up 20-ft. antenna lengths erected by bolting through foot pads.

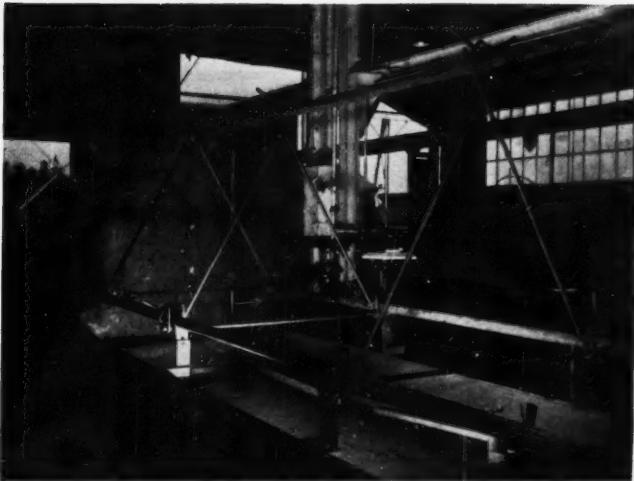
Solid Steel Rod Welded For 750-Ft. Radio Tower

By J. B. McCORMICK

District Manager
Lincoln Electric Co., Cleveland, Ohio

at corners of a 6 1/2-ft. square, are uniform in size and shape with the exception of the bottom one which is tapered in and welded to a 24-in. dia. 1 1/2-in. plate that in turn is bolted to a special insulated pin connection.

The first step in the assembly of the sections is the welding of the legs to 1 1/2-in.-thick foot pads. The pads are clamped into a power positioner and the friction cut-leg rods inserted into a hole in the center of the pad to a depth of 3/4-in. The extended end of the leg is supported on a tripod around which is built a scaffold for a second operator. The operator at the positioner welds the pad to the leg with a two-pass fillet weld using



JIG HOLDS 20-FT. SECTIONS for tack welding. Bracing is pre-cut with friction saw and then fitted at jig. Fit-up is flame-cut.



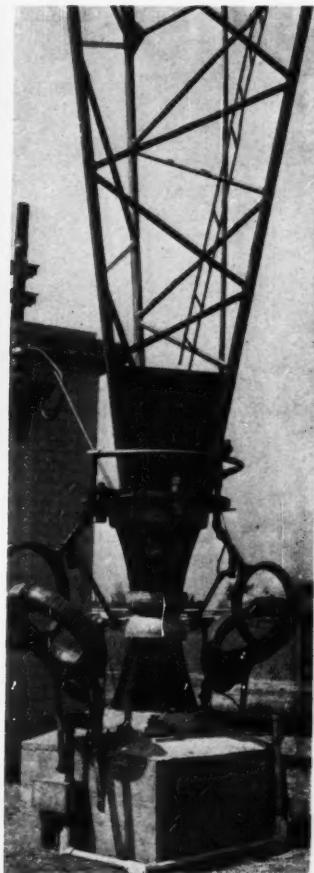
TACKED 20-FT. SECTION is next moved to trunnion-mounted positioning jig for finishing.

300 amp. and a $\frac{1}{4}$ -in. Fleetweld No. 7 electrode for the first pass and Fleetweld No. 11 for the second pass. At the same time the operator on the scaffold at the extended end of the leg is welding the leg to the bottom side of the pad at that end but up in the pad center hole so that the bottom of the pad is smooth. The leg is then turned around and the operation repeated so that the leg is joined with fillet welds on both sides of the pad.

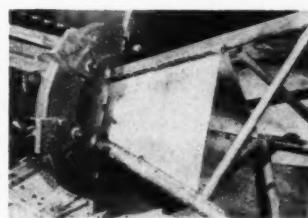
The legs are then taken to an assembly jig to which the legs are bolted and braced. Here all cross-bracing rods are fitted into the section and the hole completely pre-tack-welded.

The tacked 20-ft. section is next moved to a trunnion-mounted positioning jig. All welding on the section is completed here in a downhand position as far as is possible. A 3/16-in.-dia. electrode is used with 225 amp. for this finish welding, the reduced current tending to minimize distortion. With the positioning jig, two operators weld two and one-half sections in 8 hr. The tower section is now ready for painting and transportation to the erection site.

The technique for welding the pads on the tower legs, which was worked out with this job, eliminated two handling operations of the completed section. The previous method was to complete the



CERAMIC INSULATOR designed to allow movement of guyed antenna supports 104-740-lb. weight of tower.



TOWER'S BOTTOM SECTION is clamped to positioning plate. All welds to $1\frac{1}{2}$ -in. base plate are two-pass welds.

welding of the legs and bracing, then turn the section on end and weld pads on all six legs. The new sequence of operation eliminates turning the section on end.

These money-making

ORLANDO, FLORIDA

Cutting this ditch for a curb line takes power and capacity. The sturdy No. 12 has both to spare.



SANTA FE DAM, CALIF.

Grading a haul road for heavy trucks on top of the dam, the No. 12 leaves a smooth surface in rocky material.



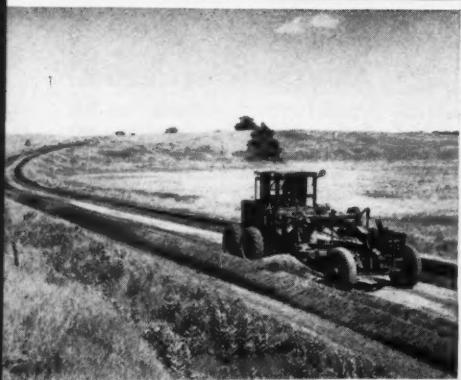
BALTIMORE, MARYLAND

Setting the pace for the paver, the No. 12 moves right along finishing final grade on the Philadelphia road.



RAMSEY COUNTY, MINN.

Keeping good roads good — another chore for the No. 12, windrowing on oil mix for stabilizer base.



BERTHOUD PASS, COLO.

8000 feet up! This new road requires fine, accurate finishing. The No. 12 "can do" within $\frac{1}{4}$ inch.



motor graders

ALL YEAR AROUND, on hundreds of construction and highway jobs, you'll see these husky one-man "Caterpillar" Diesel Motor Graders tackling a wide range of tasks. In scorching heat and bitter cold, they have the rugged stamina for heavy grading, as well as the accuracy for fine finishing. Designed and built entirely by one manufacturer, they're all "Caterpillar"—front axle to radiator cap. And they're sold and serviced by one reliable, well-equipped dealer. The advantage is all yours with these hard-working money makers in your line-up.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

sure get around!



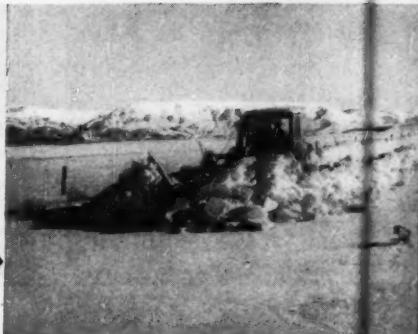
GRAND COULEE DAM, WASHINGTON

Relocating a highway calls for banksloping, ditching, grading. That's duck soup for the No. 12.



IDaho FALLS, IDAHO

150 miles of Bonneville County road to keep clear. Equipped with V-type snow plow and wing, the No. 12 does the job.



CENTRAL VALLEY, TRACY, CALIF.

The versatile No. 12, besides maintaining haul roads, is also used for smoothing canal bed ahead of a Monihan.



WASHINGTON COUNTY, COLORADO

A No. 12 widens and rebuilds as much as one mile of road a day.

CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL

ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Present and Accounted For...A PAGE OF PERSONALITIES



MORE THAN 100 YEARS of construction experience with same West Coast firm is represented by these men. A. B. SWINERTON (center), president of Swinerton & Walberg Co., San Francisco, is shown here with two superintendents with long records of service, C. C. NEMETZ (left) and R. I. GUNN. Swinerton joined forces with the firm's founder, Charles J. Lindgren, in 1907 to form Lindgren & Swinerton, Inc. In later years firm name was changed to Swinerton & Walberg Co.



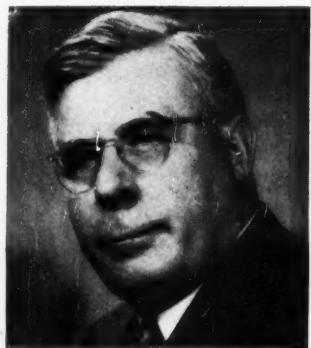
DONALD B. STABLER, contractor of Harrisburg, Pa., and graduate of Lehigh University, has been elected president of Associated Pennsylvania Constructors. He is also director of Constructors Division of American Road Builders' Association.



HOOVER MEDAL WINNER, in recognition of his work for engineering profession in solution of national and international problems, is MALCOLM PIRNIE, past president, American Society of Civil Engineers, and New York consulting engineer.



A. S. MARVIN has been appointed division engineer in charge of Pittsburgh engineering department of American Bridge Co. He joined company in 1924, following graduation from University of Colorado.



NEW ALASKA CHAPTER at Anchorage of Associated General Contractors of America is headed by R. H. STOCK, member of contracting firm of Stock & Grove, Inc. of Anchorage. A graduate of University of Michigan (1913), Mr. Stock has built dams and irrigation works in Montana and hydroelectric plants in Michigan.

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NEW PRESIDENT of Southern California Chapter, largest local unit of Associated General Contractors of America, is J. A. THOMPSON (below) of J. A. Thompson & Son, Inglewood, Calif. Mr. Thompson has been in the contracting business since his arrival from Canada in California in 1922. He has been engaged principally in street and highway work.

THEODORE J. KAUSER (below), managing director of Wire Reinforcement Institute, Washington, D. C., for last three years, has been appointed director of Ohio Department of Highways. He succeeds Earl L. Reeb who had held post since February 1948. Mr. Kauer spent 15 years with Ohio Department of Highways, following his graduation from Ohio State University.

NAMED PRESIDENT of Ford, Bacon & Davis Inc., engineers of New York, Philadelphia, Chicago and Los Angeles, is E. S. COLDWELL (below), who succeeds James F. Towers. Mr. Coldwell is a graduate of Massachusetts Institute of Technology and of Harvard University. He has served with company since 1926.





ALL OVER THE COUNTRY THEY'RE DIGGING "*IN THE DRY*"



OUTLET TUNNEL — LONG BEACH, CALIF.



RELIEF SEWER — BROOKLYN, N. Y.



BUILDING FOUNDATION — MOBILE, ALA.

with MORETRENCH WELLPOINT SYSTEMS

Sewers in Minnesota . . . pump stations in New Jersey . . . river crossings in Texas . . . foundations in North Dakota . . . !

Why do so many contractors in so many states on so many different types of jobs invariably select MORETRENCH when they have a pumping problem?

The reason is simply this: MORETRENCH gives results—quickly—at a low final cost.

When you're figuring a wet job, figure it with **MORETRENCH**.

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New Jersey

FAST ACTION UP FRONT!



YES — You get plenty of fast action when TRAXCAVATORS are on the job—digging, grading, stripping, bulldozing or any other of the many material moving and handling jobs that they do so well. And fast action is important —because it means more material handled in less time and *at greater profit*.

TRAXCAVATORS are expressly built to do fast, tough digging at rock-bottom costs! Mounted on big, powerful, sure-footed "Caterpillar" track-type tractors, they give you a combination that gets more work done in less time and for less money than any other ma-

chines of comparable size and capacity.

Investigate TRAXCAVATORS—find out how their direct, powerful digging action and high mobility can help you in your work. Your nearest TRACKSON—"Caterpillar" dealer will be glad to show you how TRAXCAVATORS are used for all kinds of earth-moving and material-handling jobs . . . road and street building and maintenance, pit and quarry work, stockpiling, snow-removal, and hundreds of other similar jobs. It will pay you to see him today or write direct to TRACKSON COMPANY, Dept. CM-29, Milwaukee 1, Wisconsin.

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WHICH tires move the most yardage . . . stay on the job longest . . . with the least downtime? The answer is Firestone.

Off-the-Highway tires were pioneered by Firestone. They have held leadership ever since only because they are built stronger, they are built tougher, they are built to stand up on the job, and save you money.

Any Firestone Dealer or Firestone Store can prove these facts. He will be glad to show you on your own equipment on any job.

*Listen to the Voice of Firestone
every Monday evening over NBC*

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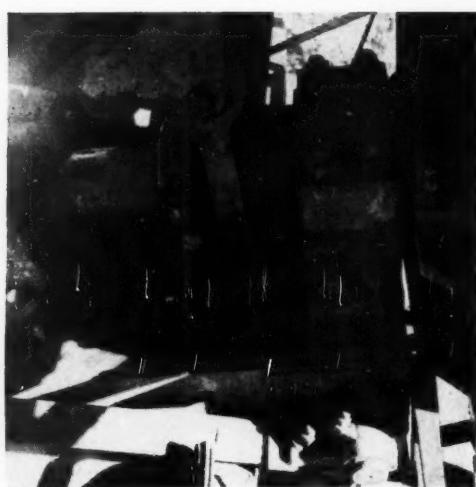
FIRESTONE
OFF-THE-HIGHWAY TIRES



DRIVING BATTER PILES IN CLOSE QUARTERS



TO DRIVE piles on a double batter near existing pipeline, special rigs were built with pivot only 16 ft. from bottom of 56-ft. leads.



HEART OF MACHINE is double shaft which permits rotation of leads in both directions. Upper shaft takes bending as well as shear, so must be larger.

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FLOATING CRANE unloads piles from barge and places them on . . .

. . . TIMBER sleds for transportation to driver.



TO DRIVE BATTER PILES near an existing pipeline, Ben C. Gerwick, Inc., San Francisco contractor, built special skid drivers with low pivots on the leads. Two of these rigs with other equipment permitted efficient driving of some 5,000 piles along a 10½-mi. length of the second Mokelumne aqueduct built for the East Bay Municipal Utility District across the Sacramento-San Joaquin River delta. The job was further complicated by salt marshes, sloughs and peat land that the job crossed. This made

transportation of the heavy concrete piles difficult.

Almost all of the 5,000 precast concrete piles, ranging in length from 16 to 55 ft., were battered, about 80 percent being driven on two-way batters. These piles are under footings for a new 69-in. water pipeline.

To permit the driver to operate close to the existing pipeline and still place the double batter piles, the 56-ft. leads on the two drivers built for this purpose were each pivoted 16 ft. from the ground. Two

shafts, one 3 in. and one 8 in. in diameter, supported the leads and permitted them to rotate in both directions.

The driver, equipped with two steam winches, was powered by a 60-hp. steam boiler. One was three-drum, the other a single-drum for swinging the leads. Hammers were No. 1 Vulcans.

Getting the piles to the drivers was difficult. Because of poor ground conditions, trucks could not operate all the way to the drivers. They were brought in to the area



LUMBER carriers move piles...



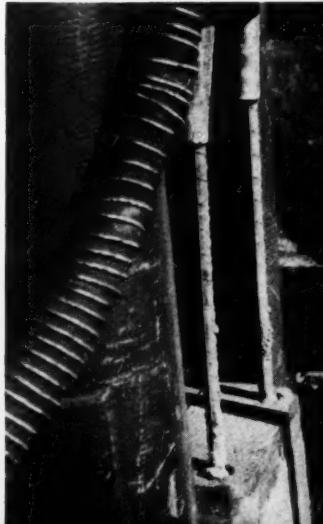
. . . BUT SOMETIMES they get stuck in soft going and have to be pulled out.

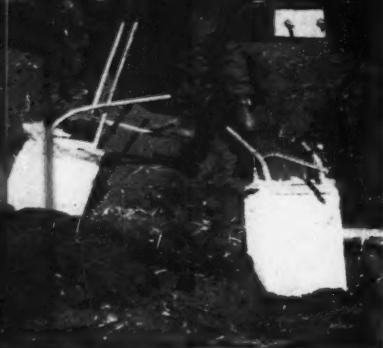
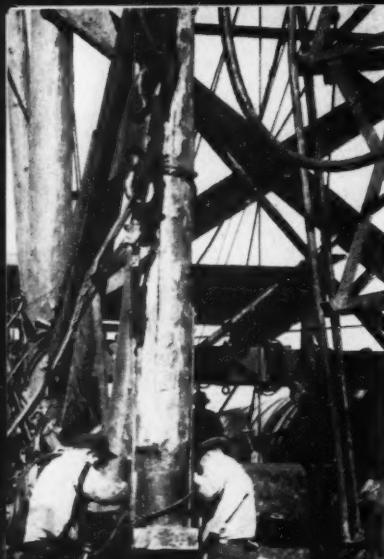
WHEN GOING IS TOUGH, sleds are pulled to driver by tractor.



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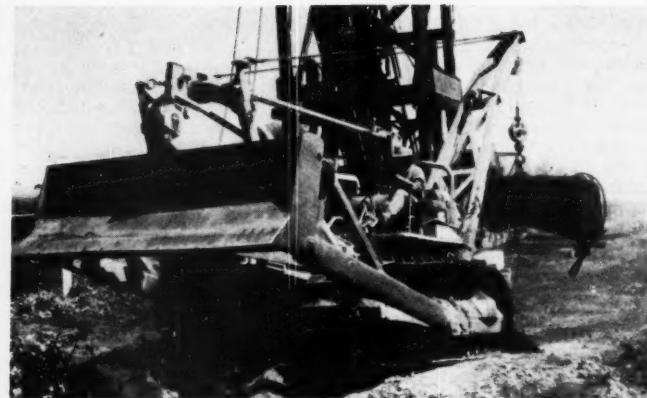
REINFORCING BARS projecting from top of piles are threaded into pipe sleeves in hammer cap.



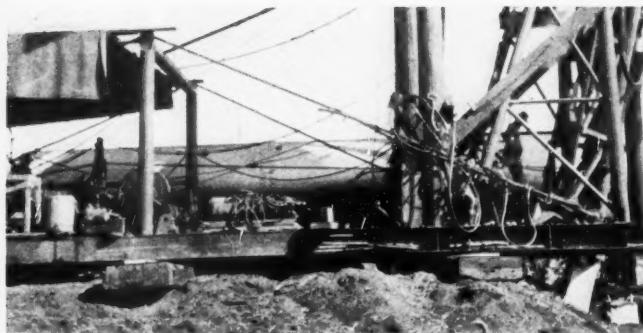


HELPERS BEND reinforcing so driver can be skidded over piles in place.

by barge and unloaded at two points, one near each end of the job. Cranes placed them on timber sleds which were picked up by lumber carriers. When a carrier



TRACTOR MOVES extra-wide skid timbers ahead.

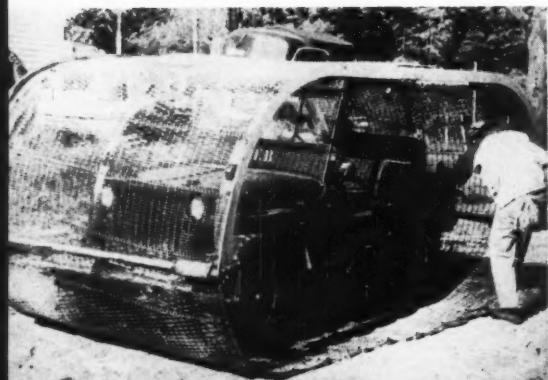


HARDWOOD 2x12-in. inserts act as wearing surfaces on 12x36-in. skid timbers.

bogged down, it lowered its sled to the ground and a tractor then dragged the sled to the driver.

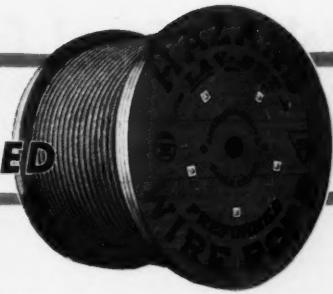
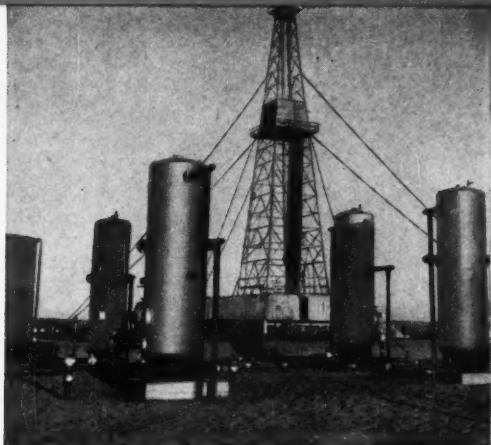
This job is a project of the East Bay Municipal Utility District, J.

S. Longwell, chief engineer and general manager. The double batter drivers were devised by Don Weaver, general superintendent for Ben C. Gerwick, Inc.



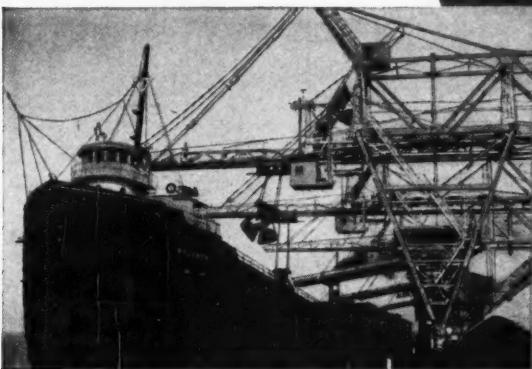
YOU CAN'T STOP THE MARINES NOW! This strange device, a continuous road matting on rollers which operates like a treadmill under wheels of jeep, is for travel over swamps, potholes, bogs, soft beaches and heavy underbrush. Rigid frame on top half of squirrel cage allows clearance for jeep and driver. Here it is being tested at Quantico, Va.—Wide World Photo

Improved Performance with LAY-SET PREFORMED



"Make hole" deeper—faster—is the demand in the oil fields. The deeper the hole goes, the greater the weight of drill pipe and tools. The faster it goes, the greater the shock loads in pulling and running in pipe. Hazard makes LAY-SET Preformed in Seale construction, with tough improved plow steel wires, and an independent wire rope core. LAY-SET's improved performance makes it THE rope for deeper faster drilling.

The powerful "cat" and ravenous carrier-scrapers cut down hills and fill in valleys. They make modern roads, airports, dams, and industrial sites—yes, even remove overburden in strip mining operations. Hazard's LAY-SET Preformed Streamlined Scraper Cable is designed for the tortuous sheaves and reverse bends that prove the quality of the rope. It will improve the performance of your equipment.



Coal and ore bridges hurry to load and unload ships and cars. The wire ropes travel fast as the 5, 10, 15-ton load speeds from ship to shore. Ropes whip. Quick starts and short stops mean extreme shock loads. Sharp steel edges mean cutting and abrasion. Tough conditions, but Hazard's LAY-SET is made in the right constructions for bridges. You can get the exact ropes that will improve performance and serve you best.

Whatever the field—logging, mining, building elevator, contractor, industrial, marine, or oil—Hazard wire ropes give you improved performance.

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Welded Steel Framework Cuts Cost 50%

By Francis J. Schroedel, President
Schroedel Construction Company, Milwaukee, Wisconsin

DIRECT savings of 50% over masonry and fire resistive construction are being realized in the erection of four 12-family apartment units, eight 16-family units and one 24-family apartment for the Estabrook project in Shorewood, Wisconsin. These savings result from greatly simplified construction methods using steel members for wall frame and floor joists and are made possible by arc welding.

A modular design using 2-foot increments enables mass production arc welding techniques for fast, low-cost shop fabrication of wall panel members for the first and second floors. Bethlehem open-web expanded-steel studs are welded between a channel cap or girt and a sill plate for both the first and second floor panels. Three-quarter inch channel is added between the studs for horizontal bracing.

During field erection, the wall panels are raised into position, held in place with a simple clamp (Fig. 1) and arc welded with $\frac{5}{32}$ " diameter "Fleetweld 5" electrode, using 200-amp. engine-driven Lincoln "Shield-Arc" welders. The first floor framing is welded into an integral unit, and a finished concrete floor is later poured to cover the sill plates thus anchoring the building frame in position.

An "I" beam, supported by two outside



Fig. 1. Arc welding steel panels to form the side walls. Panels are made from 4" Bethlehem expanded steel studs.

walls and the center utility room walls, forms the center support for the expanded steel second floor framework. The erection of the second floor panels is then done without the need for any scaffolding.

Exterior walls are finished with

masonry, and interior plastering is applied to metal lath. In addition to direct cost savings in the building erection, additional benefits are easier, less costly installation of plumbing, wiring and insulation. The structure is both shrink-proof and verminproof.



Fig. 2. Placing second floor prefabricated steel wall panels in position. Panels are hoisted and welded in place without use of any scaffolding.

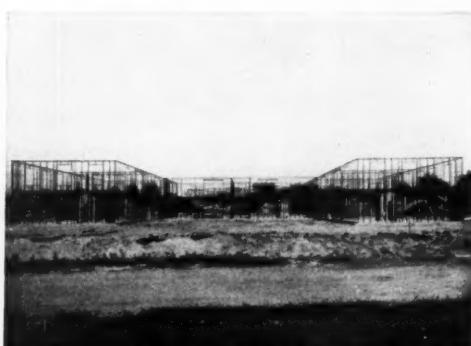


Fig. 3. Framework for one of many multiple family apartments built with all-welded steel construction. The Estabrook Homes project is located in Shorewood, Milwaukee, Wisconsin.

The above is published by **THE LINCOLN ELECTRIC COMPANY** in the interests of progress.
Architects and engineers are invited to write on their letterheads to be placed on mailing list for Structural Welding Studies.
The Lincoln Electric Company, Dept. 171, Cleveland 1, Ohio.

Tunneling Avoided on Canal Siphon

IT TAKES more than mere streams and railroad lines to force Winston-Utah Co., contractor, to resort to tunneling when laying a siphon on the East Low Canal of the Columbia Basin Project in eastern Washington. Here pictures show how entire siphon was laid in the open without seriously disrupting either Great Northern train traffic or the flow of Crab Creek, by juggling paths of both. Siphon will carry water for 250,000 acres of the Columbia Basin.



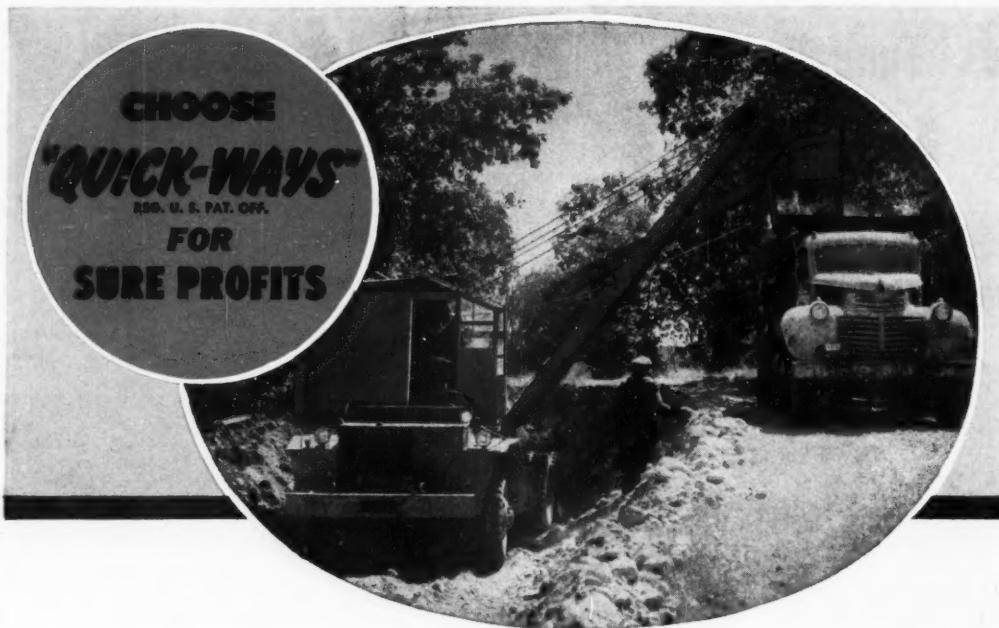
ORIGINAL PATH of Crab Creek has been diverted toward camera and now roadbed (arrow) is being prepared for railroad. Small lake, where excavation for siphon has filled with seepage water, was pumped out.—U. S. Bureau of Reclamation Photos.

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SIPHON (below) begins to take shape between new railroad detour in background and diverted path of Crab Creek in foreground.



**CHOOSE
"QUICK-WAYS"
REG. U. S. PAT. OFF.
FOR
SURE PROFITS**



PORABILITY AND CAPACITY... these are the fundamentals you KNOW you want in a truck shovel. You get **PORABILITY** in a "QUICK-WAY" because it is built of steel for lightness and strength, no heavy counter-weights to slow you down. You get **CAPACITY** because balance and stability are designed into your "QUICK-WAY".

In addition you get **SPEED . . . PERFORMANCE . . . VERSATILITY . . . INTERCHANGEABILITY . . . SIMPLICITY . . . ECONOMY OF OPERATION . . . LOW FIRST COST . . . LOW MAINTENANCE . . . and EXTRA PROFITS.**

A "QUICK-WAY" mounts on ANY standard truck of proper size to go anywhere a truck can go at truck speed. A "QUICK-WAY" is CONVERTIBLE IN MINUTES from SHOVEL to CRANE, DRAGLINE, CLAM-SHELL, PILE DRIVER, SCOOP, TRENCH-HOE or BACK FILLER. You buy only the attachments you want. A "QUICK-WAY" is simply built, with many interchangeable

able parts, all easy to service . . . and durable.

THE FUNDAMENTALS built into every "QUICK-WAY" add up to sure profits on a small investment, with one of the most useful machines you can own.

NO MATTER WHAT OTHER EQUIPMENT YOU OWN, you need "QUICK-WAYS" too. There's a "QUICK-WAY" owner near you; ask HIM.

• Service available from Distributors strategically located throughout U. S. Others worldwide



MODEL E: 4/10 cu. yd. cap. for mounting on any standard 5-ton truck.

MODEL J: 1/4 cu. yd. cap. for mounting on any standard 1½-ton truck.

For speed, portability, economy of operation, and adaptability to a wider range of jobs, nothing of comparable size equals a "Quick-Way" Truck Shovel.

"QUICK-WAY" TRUCK SHOVEL CO.
DENVER, COLORADO

**YOU CAN BE SURE.. IF IT'S
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A-C Welding will help!

The typical experience of an eastern manufacturer demonstrates how Westinghouse a-c welding equipment can help you to offset rising operating costs. Using 27 newly-installed Westinghouse a-c machines, this customer enjoys a monthly saving of \$810.00 in power costs alone . . . enough to pay for the entire installation in 18 months!

The Westinghouse Flexarc "65" pictured above, has all the features that contribute to this kind of cost slashing performance. Its higher electrical efficiency and lower "no load" losses mean lower power bills. Its lack of moving parts means substantially reduced maintenance expense. Its ability to provide good welds, faster, means fewer man hours and an attractive saving in wages.

Flexarc "65" welders are available in 200, 300, 400 and 500-ampere ratings and operate with an open-circuit secondary voltage of *only 65 volts*. Arc striking

is easy and good arc stability is maintained without the addition of troublesome gadgets.

Westinghouse welding engineers are ready to assist you in planning the switch from d-c to a-c or in applying a-c to jobs where you have not before considered welding. But first, get the complete story on the advantages of a-c welding in booklet B-4199. Address: Westinghouse Electric Corporation, P. O. Box 2025, Buffalo 5, N. Y.

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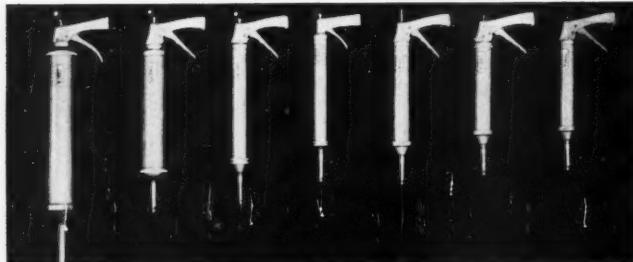
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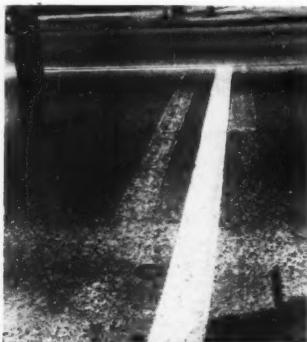
CONSTRUCTION EQUIPMENT NEWS

FEBRUARY 1949 REVIEW
of Construction Machinery and Materials



CALKING GUNS — Supplied in seven sizes and types ranging from one pint to 2½ qt. capacity. Some models use bulk caulk only while others use bulk caulk or cartridge-load caulk. One new model has a smooth drive rod and a unique swivel handle for convenient caulking angles. Guns are made of steel, bronze, and aluminum and are fin-

ished in hard gun metal enamel or cadmium on special order. All except three models are supplied with ¾-in. nozzles. All nozzles are interchangeable with the new Vital calk-stop nozzle. All except one gun are equipped with finger-form trigger and contour handle.—**Vital Products Mfg. Co.**, 7500 Quincy Ave., Cleveland 4, Ohio.



TRAFFIC PAINT—Based on synthetic resin and chlorinated rubber, paint is claimed to be durable and to dry rapidly. Drying speeds vary from 11 to 20 min., reducing amount of time traffic has to be rerouted. Test cross lines laid down on heavily traveled highway intersection in New Jersey showed little signs of wear after more than two months of service.—**Hercules Powder Co.**, Wilmington, Del.



COMPACT PORTABLE SPRAYER—Completely self-contained Payswell sprayer operates with a built-in compressor which eliminates the need for hose or separate motor. Total weight of only 4 lb. includes a quart container which is part of the unit. Enclosed motor operates from any 110-v. electrical outlet, ac. or dc., at a speed of 10,000 rpm., producing 50 psi. pressure, enough for complete atomization of any paint or

liquid. Interchangeable nozzles provide a spray pattern of either cone or fan shape. Container is non-breakable. Pistol grip, trigger control and balance of unit make for easy handling. Suitable for small industrial painting jobs.—**Selleo Corp.**, 815 Andrus Building, Minneapolis 2, Minn.



FLEXIBLE TEMPLATE—Can be set and locked to any desired shape, contour, curve or radius and transferred anywhere for construction or checking purposes. Springs back to original position when unlocked, ready for reuse. Eliminates trial-and-error fitting wherever curved materials must be fabricated or duplicated. Device of spring steel and aluminum construction is available in lengths of 1-ft. intervals. Shortest length is 2 ft. Applications include pipe bending, conduit curving, form construction, sheet metal shaping, plate glass curving and wood shaping.—**C. H. Clark and W. E. Poggenburg**, 4900 Winnefield Ave., Philadelphia, Pa.



REAR-END POWER SHOVEL—Hydro-Scoop, with 10-cu.ft. dipper, is designed for mounting on hydraulically equipped tractor. Uses hydraulic power to scoop, shovel, lift and dump earth or other bulky material. Loads can be dumped in a pile or spread and leveled. Shovel takes a bite 24 in. deep. Special hitch adapts it to fit International Model C tractor and other tractors. Scoop can be mounted or dismounted in less than 5 min. Reversible feature makes it easy to get shovel in close to buildings or fences or stockpiles.—**Stockland Road Machinery Co.**, 2653 34th Ave., So., Minneapolis 6, Minn.

LONG TIMBER PILES Driven Under Water

McKiernan-Terry No. 9-B-3 Double-Acting Hammer drove 894 fir piles 72 to 78 feet long, under water, for the foundation of a concrete lock through the East Atchafalaya Basin protection levee at Bayou Sorrel, La. R. Thomas McDermott & Co., Inc., contractors.

This lock, cut through a levee, forms a link that permits uninterrupted navigation between the Mississippi River and the Gulf Intracoastal Waterway, lying west.

In telescopic leads the 9-B-3 McKiernan-Terry Double-Acting Hammer, submerged, drove 78-foot piles to 29-foot cut-off below water, or until the point of pile was within one foot of the bottom of the excavation. Later, this hammer drove steel sheet piling for cut-off walls. The hammer and pile driving rig were powered by two Lambert-National Engines and oil fired boilers—products also of McKiernan-Terry Corporation.

This difficult project is typical of countless jobs for which engineers and contractors unhesitatingly select McKiernan-Terry Pile Hammers. For the standard McKiernan-Terry line of ten double-acting hammers, five single-acting hammers and two double-acting extractors gives a choice in size and power to meet any specific needs.

FURTHER INFORMATION

Send for latest literature giving specifications, etc. on McKiernan-Terry Double-Acting and Single-Acting Pile Hammers.



**MCKIERNAN-TERRY
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Manufacturing Engineers
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OTHER MCKIERNAN-TERRY
ACTIVITIES

McKiernan-Terry quality and engineering excellence are also found in coal and ore bridges, bulk material unloaders, marine equipment and other large engineering structures performing important service to industry, railroads and our government.

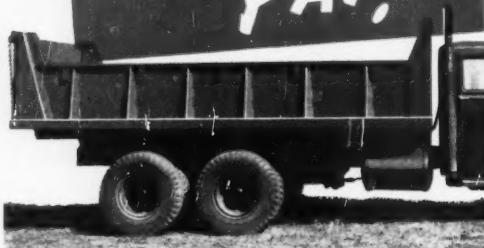
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McKiernan-Terry PILE HAMMERS AND EXTRACTORS

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 WHEN YOU WANT
BODIES & HOISTS
 FOR

PAYLOADS
 THAT REALLY
PAY!



Photos show a PERFECTION No. 354 heavy-duty Dump Body of 10 yd. capacity; length 204", width 84". Equipped with

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 IN ALL SIZES : FOR ANY USE



MEDIUM-SIZED TOURNAPULL—

Designed as medium-sized, high-speed earthmoving equipment, Model C Tournapull is used with Model E16 carryall scraper which has a capacity of 13.3 cu.yd. or 16 tons. Unit is powered by 150-hp., 6-cylinder diesel engine and has four forward speeds ranging from 2.19 to 17.3 mph. Steering, scraper bowl, apron and tailgate are controlled by individual electric motors operated by 240-v., a.c. generator built in line with the Tournapull engine. Constant mesh transmission gives instantaneous selection of gear ratios without shifting gears. Positive power two-speed electric steering gives complete maneuvering control. Equipment rolls on big 21x25 tapered bead tires under low operating pressure to increase flotation and traction in soft ground. Fuel capacity has been increased to 130 gal. Over-all specifications of Tournapull, with scraper, are: length, 31 ft.; height 9 ft. 3 in.; width, 11 ft. 4 in.; wheelbase, 18 ft. 2 in.; empty weight, 29,220 lb. Outfit can turn around in 14 ft. 6 in.—R. G. LeTourneau, Inc., Peoria, Ill.



WELD CHIPPING HAMMER—

Makes possible replacement of worn bits. In new tool named "Re-Bit," simple taper locks both bits securely in the head in any position desired without use of screws or clamps. Blade has been redesigned to provide better visibility, longer life, easier access to tight spots and a wider chipping edge. Offered in 12- and 16-oz. weights with a choice of Flex-o-Steel or wood handles.—Atlas Welding Accessories Co., 707 E. Lewiston St., Detroit 20, Mich.

THESE BLACKHAWK PRODUCTS CUT YOUR CONSTRUCTION AND MAINTENANCE COSTS



BLACKHAWK SOCKET WRENCHES CUT YOUR COSTS 4 WAYS

LOCK-ON

This exclusive patented Blackhawk feature locks combinations together rigidly. Sockets can't come off except by thumb release button. Eliminates lost time, damage and injury from sockets falling in machinery, gear boxes, etc.



COMPLETE RANGE

Whether it's midgets or big brutes, you'll find a Blackhawk socket for the job. And the assortment of handles and attachments permit hundreds of combinations — eliminate wrench "specials".



HOT BROACHING

This original Blackhawk feature insures smooth socket walls — eliminates ripped socket walls and consequent cracking, rust and nut wear.

TORQUE INDICATORS

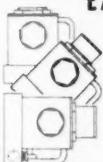
Blackhawk tension wrenches range in capacity from 33 to 1000 ft. lbs. They assure you of correct tensions—eliminate bolt breakage, gasket blow-by's, assembly breakdowns, etc.

ONLY BLACKHAWK HYDRAULIC JACKS GIVE YOU THESE EXCLUSIVE ADVANTAGES



94% EFFICIENCY

Eliminates "man-killing" friction loss that cuts screw-type jacks to 12 to 30% efficiency.



MULTI-DIRECTIONAL OPERATION

Pump-on-side feature permits full power in any position vertical to horizontal.



LONGER LIFE

Exclusive Blackhawk process produces mirror smooth cylinders, reduces cup wear.



Porto-Power MAKES "SAMSONS" OUT OF MAINTENANCE MEN

ONE Man With a Porto-Power Can Do These Jobs



Pull Gears, Wheels and Pulleys

Porto-Power combination pulls quickly, smoothly, safely, without damage.



Raise Sagging Beams —

Porto-Power with attachments builds up to any length — works with full power at any angle.



Lift Machinery

Toe-tilt Porto-Power attachments get under low machinery — remote control lets operator work at distance.



Pressing and Testing

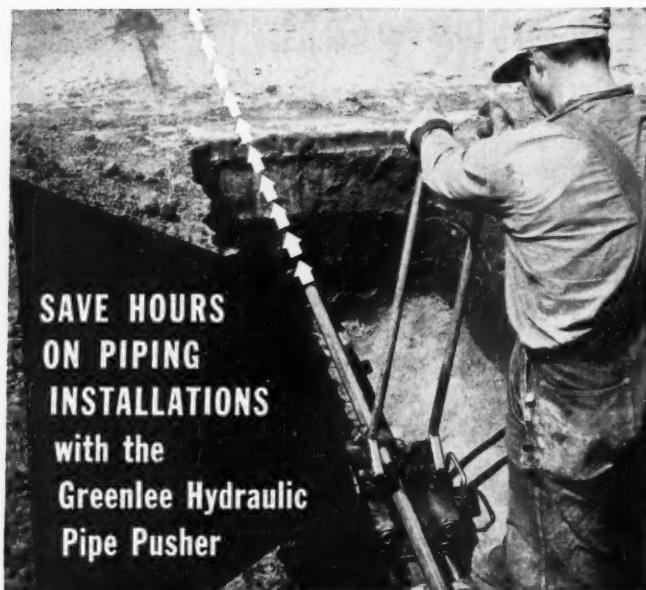
Porto-Power can be used in press built from free Blackhawk plans. Can be gauge-equipped.



Equipment Maintenance

Attachments adapt Porto-Power to dozens of jobs such as straightening frames, axles, etc.

AMERICAN HYDRAULIC CO., COR. DIV. PORTO-POWER MILWAUKEE, WIS.
BLACKHAWK
HAND JACKS • WHEELED JACKS • SOCKET WRENCHES • PORTO-POWER



**SAVE HOURS
ON PIPING
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Greenlee Hydraulic
Pipe Pusher**

**... and a Greenlee Hydraulic
Pipe and Conduit Bender**

Yes, let a GREENLEE Hydraulic Pusher help speed and simplify your underground piping jobs. With it one man pushes pipe under streets, railways, walks, flooring and other obstacles. You eliminate extensive ditching . . . no tearing up of concrete, lawns, floors . . . no backfilling, tamping, tunneling, repaving. Two models: one for pipe up to 4" and one for larger pipe, ducts, concrete sewer pipe.

You'll also save greatly on labor and material costs with a GREENLEE Hydraulic Bender on your jobs. One-man-operated. Makes smooth, accurate bends in just a few minutes—in pipe and conduit up to 4½", tubing, bus-bars. Compact, portable. Get facts now on these timesaving GREENLEE tools which often pay for themselves on the first few jobs.



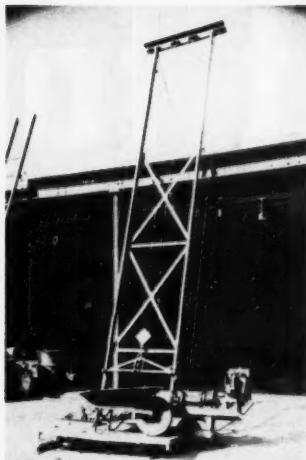
WRITE GREENLEE TOOL CO., 2182 COLUMBIA AVE., ROCKFORD, ILLINOIS
for complete data on the above equipment as well as GREENLEE Spiral Screw Drivers • Auger Bits • Expansive Bits • Plumbers' Sets • Hand Benders and many other high quality tools.



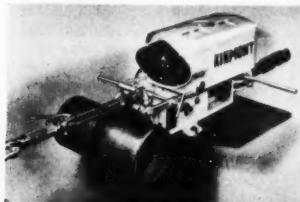
HARD-BOILED HAT—New plastic molded hat of waterproof material has crown made up of reinforcements of long interlocked fibers impregnated and bonded with a resinous binder. Possesses high shock-absorbing ability and uniform resistance to fracture under impact. Crown without structural reinforcements is a non-conductor of electricity. Impact of falling object is absorbed by wide web hammock to protect neck of wearer from serious injury. Inner cap provides safe margin of space between crown and wearer's head. Adjustable sweatband provides instant sizing from 6% to 7%. Accessories include lamp bracket, chin straps and winter liners which replace standard hammock or inner cap.—E. D. Bullard Co., 275 8th St., San Francisco 3, Calif.



PNEUMATIC PAVING BREAKER—
New 70-lb. pneumatic paving breaker, Model 24, has 28-in. over-all length, 1½x6-in. chuck sizes for collared steels, ¾-in. hose size, and ¾-in. hose inlet pipe thread.—Independent Pneumatic Tool Co., 175 State St., Aurora, Ill.



MATERIAL ELEVATING RIG — Roll-O-Hoist, powered by electric or gasoline motor, is described as a "ladder on wheels." Remote control attachment permits unit to be operated from any level. Automatic stops make it possible to load or unload at intermediate levels without the necessity of employing an operator. Fool-proof safety device controlled by counterbalanced weight of platform stops a full load within 2 in. Steel cable tested to withstand 5,000-lb. pull. Front loading platform and tip-over bucket expedite production and lower operating costs. Available in four different models varying in lifting capacities.—**Construction Machinery Sales Co., Waterloo, Iowa.**



CUTTING TORCH ATTACHMENT — Provides fast, easy adjustment of cutting torch in handling a wide range of pipe sizes and maintains a smooth bevel and a square cut-off across end of pipe. Handles pipe diameters from 3 to 36 in. and tanks up to 10 ft. dia. when turned on a roller rack. Turning speed of power unit is controlled while cutting operation is in progress. Foot switch controlling turning operation leaves operator's hands free to control torch and speed adjustments. Split link chain drive permits rapid fastening and unfastening of the work being turned and holds pipe tightly locked in position.—**Kinmont Mfg. Co., Inc., 716 W. Wilson Ave., Glendale 3, Calif.**

Century

PORTABLE REFRACTION SEISMOGRAPH

For use where first arrival information only is needed. Designed specifically for accurate determination of water table or depth of bed rock for dam sites, buildings and other major construction projects. Applicable for sounding of ice depth and other geophysical exploration purposes. Units consist of Century Portable Oscillograph, Attenuator Panel in all-aluminum case and six Seismometers. All units are waterproof and designed for portability.

Write for detailed information applicable to your particular problems.

ANOTHER  PRODUCT

Century GEOPHYSICAL CORPORATION

TULSA, OKLAHOMA

149 Broadway, New York

Built to



No motor grader without All-Wheel Drive and All-Wheel Steer can hope to equal the all-round operating efficiency of an Austin-Western "88-H," "99-H" or Master "99."

There are no idling front wheels; all weight is on drive wheels contributing 100% traction. All-Wheel Steer provides unequalled maneuverability; saves time on every job.



BADGER CONVERTIBLE SHOVEL. $\frac{3}{4}$ -swing design eliminates tail swing; makes it possible to use the Badger in close quarters; reduces swinging weight and definitely increases work output. The Badger can be converted into a Crane, Dragline, Pile Driver, Trench Hoe, or Skimmer. Wheel mounts provide fast, easy job-to-job portability. A cab is available on special order.



MODEL "40" MOTOR SWEEPER. Fast, maneuverable, and economical in operation. No troublesome expensive conveyor or elevator to keep in adjustment and repair—dirt is thrown directly into the 2-yard hopper. Can be equipped with either right-hand or left-hand gutter broom or both. Leaf Broom attachment simplifies the collection of heavy accumulations of leaves.

3-WHEELED ROLLERS. Models in sizes ranging from 6 to 12 tons. All have full length side plates for maximum rigidity; low center of gravity for smooth operation, and hydraulic power steer. All may be had with gas or diesel engine. The Roll-A-Plane attachment produces maximum density and surface smoothness.



TANDEM ROLLERS. Variable weight types—in 5-8 tons and 8-10½ ton sizes. Important improvements provide exceptionally smooth and steady performance on precision jobs. Better visibility . . . less side over-hang . . . more ground clearance . . . lower center of gravity . . . steering by effortless hydraulic control.

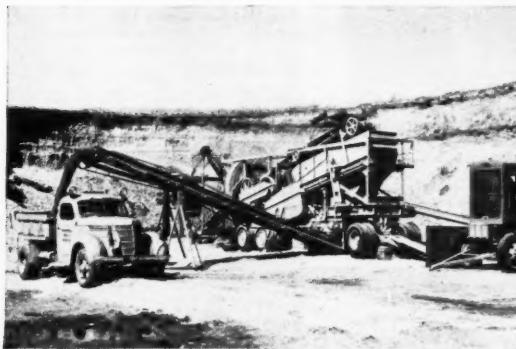


OUTPERFORM



All-Wheel Drive and All-Wheel Steer make it easy for an Austin-Western Power Grader to do a superlative job of bank sloping. The operator can do all normal ditching

and grading; then high-lift the blade to any desired bank cutting position—including the vertical—*without leaving the platform*. No other grader can do it.



PORTRABLE CRUSHING PLANTS. Built in sizes and types to fit every production requirement. Equipped with matching Crushers, Screens and Conveyors, correctly balanced to deliver the maximum amount of crushed and screened aggregate in controlled sizes. From the smallest plant to the magnificent "101" pictured above, every Austin-Western Portable Plant is engineered for low-cost tonnage.



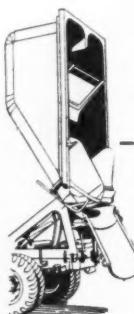
STATIONARY CRUSHING PLANTS. This limestone plant with its two Jaw Crushers and Roll Reduction Crusher is typical of the efficiency of design that characterizes every Austin-Western plant. Two men control the entire operation; one at the Primary Breaker, the other to make the rounds of the matching Crushers, Screens and Conveyors. Each Austin-Western plant is tailor-made for its job.

AUSTIN-WESTERN COMPANY • AURORA, ILLINOIS, U. S. A.

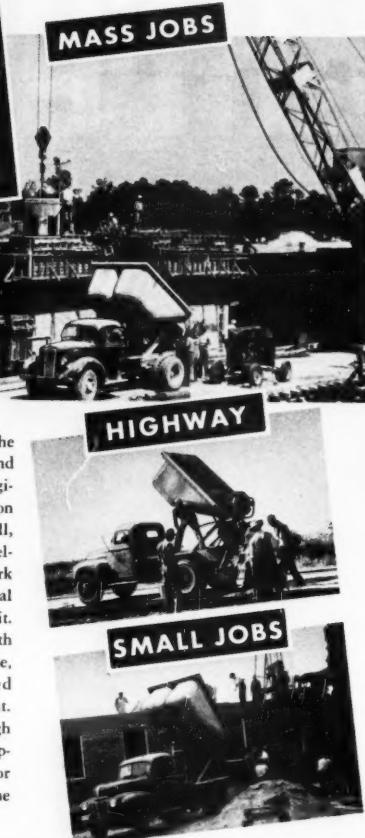
BUILDERS OF ROAD MACHINERY
Austin  **Western**



That's a lot of concrete. And the Dumpcrete placed it faster and cheaper. Mass pours for U. S. Engineers, Atomic Energy Commission and Bureau of Reclamation—small, slow pours into buggies and wheelbarrows—city and state paving work—footings and floors for industrial and housing projects. You name it. The Dumpcrete's done it . . . with identical loads of better concrete, accurately mixed at a central point. The low-cost, high production Dumpcrete can save for you too. Mail the coupon today.



The lower cost Dumpcrete is lightweight, watertight, with 13-foot chute, controlled higher discharge and lower center of gravity. Hauls sand, gravel, and coal too.



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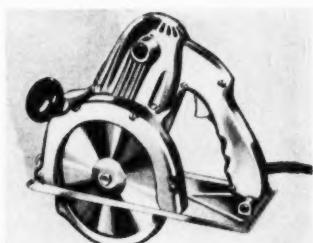
Miller trailers fit all your hauling requirements featuring 3 to 10 ton models. Model B has electric brakes, hydraulic tilt control, 16" deep axles with hub hubs and wheels, plus many other features making it the safest and most dependable trailer on the road.

Write for details
DEPT. M.



MANILA ROPE SPLICING TOOL—Rigger's fid, used like an ordinary marline spike, has detachable hollow handle that holds rope strands apart and allows incoming strands to be easily inserted.—**Fellowes & Stewart, Terminal Island, Wilmington, Calif.**

MAGNESIUM ALLOY LADDERS—New line of lightweight magnesium alloy ladders for general industrial purposes is announced. Magnesium weighs approximately two-thirds as much as aluminum. Ladders combine rigidity, strength, corrosion resistance and wearing qualities and light weight. Types include step-ladders, platform and warehouse ladders and light- and heavy-duty extension ladders.—**Aluminum Ladder Co., Worthington, Pa.**



PORTABLE ELECTRIC SAW—New Balansaw is available in models with 6-in. and 7-in. circular blades. Designed to concentrate weight on the work, not on the user's wrist. Visibility is assured by placing of blade on worker's near side where an internal blower clears the work of dust. Capacity in wood is 1 1/8 in. and speed is 3,600 rpm. Motor is universal ac. or dc. 110-v., 60-cycle. Frame is of die cast aluminum alloy with automatic safety guard. Blower cools motor, gear case and clears sawdust from line of cut. Over-all length is 12 in. and weight 11 lb.—**Cummins Business Machines Corp., 4740 N. Ravenswood Ave., Chicago 40, Ill.**



RADIAL SAW—Monarch Uni-Point radial saw features "one-point cutting" where blade enters work at same point in table regardless of cross-cut angle, vertical, horizontal or compound miter. Blade does not have to be raised and lowered when changing angles. Saw is housed on enclosed-cabinet base which supports solid hardwood table top chemically impregnated to eliminate warping. Newly designed wipers at front and back of ladder roller bearings keep track clear of dust. On telescoping ram is a ripping gage fitted with an adjustable pointer to permit high degree of accuracy in setting up work and in cutting. Automatic spring pin finder instantly locates and locks the motor in various positions for crosscutting, ripping, ploughing, boring, dadoing and similar horizontal cutting positions.—American Saw Mill Machinery Co., Hackettstown, N. J.



CURB SERVICE BOXES—New line of valve and curb service boxes in a complete range of sizes has sleeve and bottom sections of asbestos-cement pipe and tops and covers of cast iron. By means of adjustment joint, sleeve telescopes into bottom section, permitting accurate adjustment and providing a shock-proof joint to absorb service and road shocks. Marketed under trade name of "G - H shock - proof boxes".—Verako Products Co., P. O. Box 604, Waukegan, Ill.



BELLED FOOTINGS AND PIER HOLES

DRILLED WITH THE
**CALIFORNIA
EARTH BORING MACHINE**

Drilling straight pier foundations, 30" in diameter to a depth of 22', the California Earth Boring Machine drilled 10,000 linear feet of hole at a cost of \$0.55 per foot. Where spread footings are required, a special, patented belling bucket can be used.

SEND FOR LITERATURE—The jobs mentioned above and many others are illustrated and completely detailed in a new 12 page brochure. Every contractor and engineer should have a copy for his files. Ask for it on your business letterhead.

California Earth Boring Machines drill holes 10" to 72" in diameter to 200' deep for Water Wells, Soil Testing, Mineral Exploration, Calyx Drilling, Bellied Footing, Pier Holes and Oilfield work.



California Welding & Blacksmith Shop, Inc.
7222 East Slauson Avenue, Los Angeles 22, Calif.

"Speaking of truck shovels....."



Why did you buy a MICHIGAN?"

"Because I figured competition's bound to get tougher. I wanted a shovel that could cover lots of ground and make better money on all kinds of jobs. Take it from me, if you want to get the most for your money, get a MICHIGAN!"

"IT'S FAST ON THE ROAD—

Gets to the job as fast as a truck, and under its own power.



"IT MOVES DIRT FAST—

Anyway you look at it, it's yardage that counts. MICHIGAN'S 5.4 RPM swing and fast air clutches give you the extra yards a day you're after.



"IT'S REALLY BUILT—

Any time you put a shovel on a truck you need a chassis that's designed for the job. And MICHIGAN knows how—they've built their own chassis for years.



"IT'S EASY TO HANDLE—

You know that if a machine is rough on the operator he'll probably be rough on the machine. MICHIGAN'S air ram clutches are fast and easy. They take the work out of operating. That's why my operators like to run the MICHIGAN."

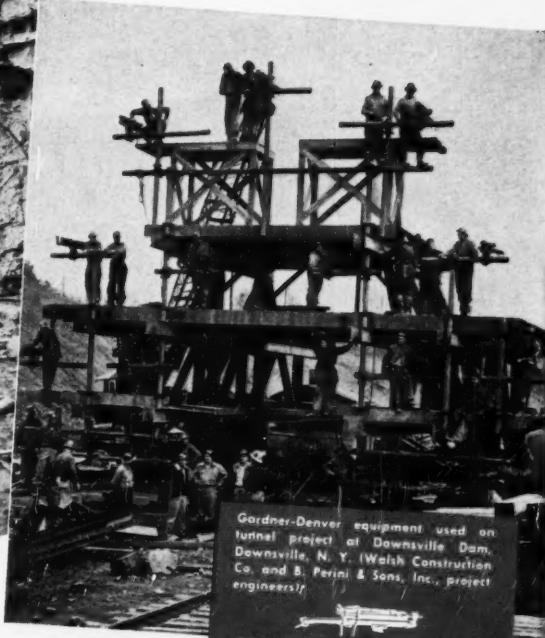
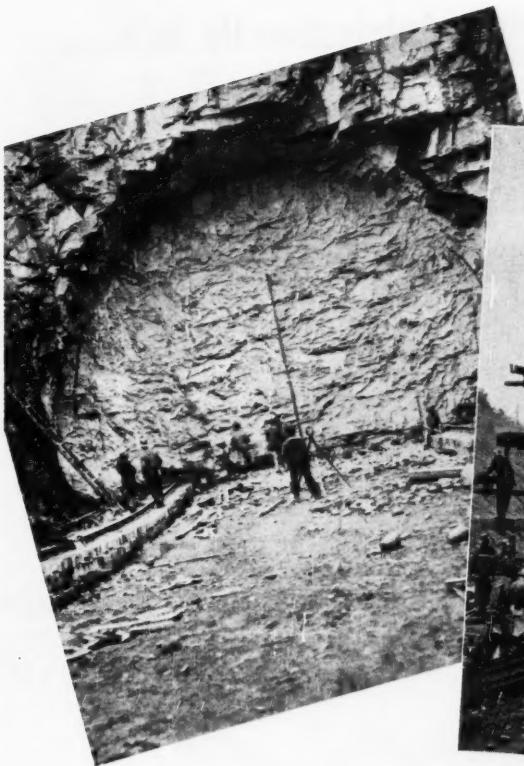


See MICHIGAN Truck Shovels at work on jobs like yours — write for Bulletin 100, "On The Job with MICHIGAN."

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A river goes to town... and Gardner-Denver leads the way

Bringing water from the East Branch of the Delaware River to New York is a big project—one that calls for linking three impounding reservoirs with the Delaware Aqueduct. To divert the flow of the East Branch of the Delaware River during the time required to complete the reservoir at Downsville, N. Y., a diversion tunnel 2200 feet long—the largest rock tunnel since Hoover Dam—is being drilled through hard bluestone. On the job is the world's largest "jumbo" . . . and on the jumbo are 20 Gardner-Denver CF99N Automatic Feed Drifters.

Naturally, Gardner-Denver equipment is much in evidence on this \$13,700,510 project. For wherever construction work must go forward without delay, the past performance of dependable Gardner-Denver equipment tells why it so often leads the way on America's biggest tunnel jobs. For complete information, write Gardner-Denver Company, Quincy, Illinois.



GARDNER-DENVER

Since 1859

Gardner-Denver equipment used on tunnel project at Downsville Dam, Downsville, N. Y. (Welsh Construction Co. and B. Perini & Sons, Inc., project engineers)

22 Gardner-Denver CF99N Drifters

10 Gardner-Denver SS5N Sinkers

8 Gardner-Denver URM & UMR99 Wagon Drills

10 Gardner-Denver VP4 Sump Pumps

10 Gardner-Denver BB7 Breakers

7 WBK-500 Portables

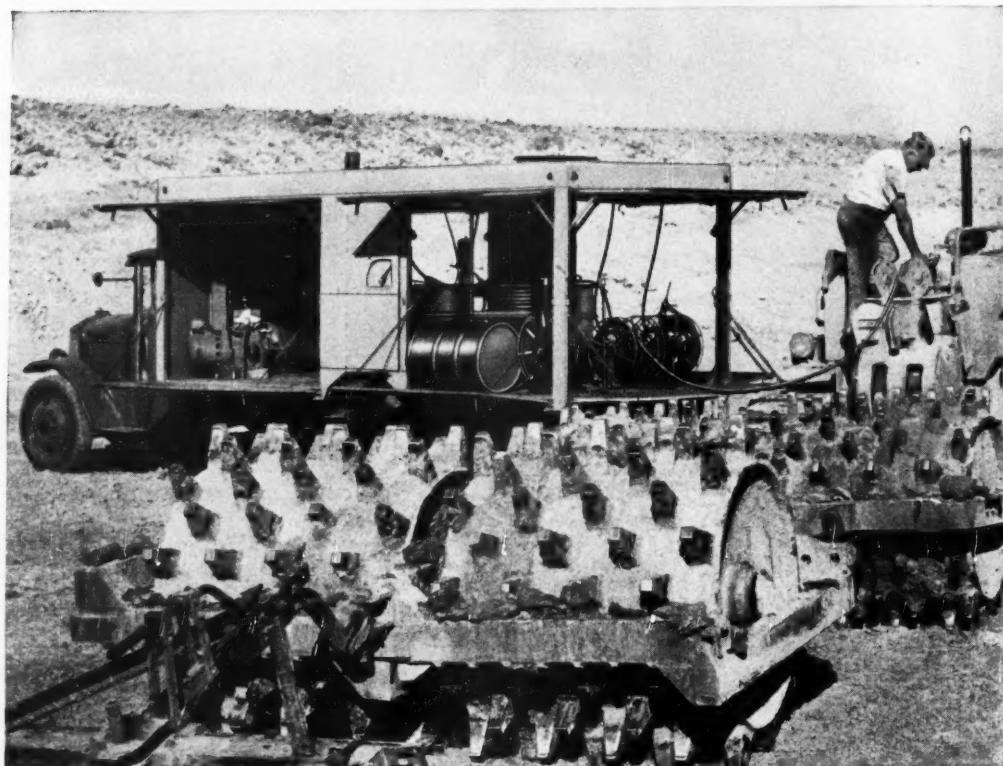
2 DS6 Sharpeners

2 DF-1 Oil Forges

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Slash Costly "Time Out" For Lubrication Up To $\frac{1}{3}$. . .



Bring Positive Power Lubrication to Machines—Right in the Field with an Alemite Portable Service Station

It actually combines in one rugged, compact, highly mobile unit the lubrication facilities of a modern superservice station. It has high and low pressure grease pumps, oil pumps, hose reels, plus all necessary connections and accessories—everything needed to provide complete barrel-to-bearing power lubrication for construction machinery right on the job.

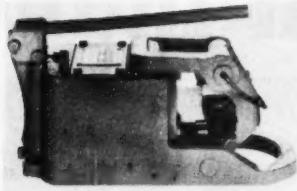
Alemite Portable Service Stations cut "down-

time" for lubrication up to 35% . . . save grease and oil . . . reduce costly bearing failures . . . lower maintenance expenses . . . increase production and profits. You can choose any combination of pumps and equipment best suited to your needs. Discover now how an Alemite Portable Service Station can make your machines produce more, last longer. Write today to Alemite, 1840 Diversey Pkwy., Chicago 14, Ill.

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WIRE ROPE CUTTER—Portable, self-contained, all-steel Hydrashear cuts wire rope up to 1½-in. dia. without deformation. Device weighing 70 lb. is manually operated by application of hydraulic pressure and does not have to be anchored when in use. Dimensions are 16 in. long, 6 in. wide and 8½ in. high. Can be used in any position, vertical or horizontal. Hydraulic pump handle can be locked in a position to serve as a convenient carrying handle. Cutting blade is easily removed for resharpening when necessary.—**Pell Cable Cutter Co., 55 New Montgomery St., San Francisco, Calif.**

SPRAYABLE MASONRY COATING—Called "Scotch-top" plastic wall covering, new compound provides both color and texture for finishing monolithic concrete, brick or block walls. Made in white and in twelve different shades of green, red and yellow. The product, a hydraulic setting material, is shipped in two parts: a liquid binder of synthetic rubber and a powder composed of plastic materials and asbestos fibers. The two parts are mixed on the site with water which serves as a vehicle for spraying.—**Minnesota Mining & Mfg. Co., 900 Sauquier St., St. Paul 6, Minn.**



LOADER ATTACHMENT—Front-end loader is designed for quick attachment to the Galion maintenance motor grader. Standard material bucket has capacity of 9 cu.ft. and an extra-large snow bucket is available. Maximum lifting height is 9 ft. 10 in., dumping clearance 8 ft., and forward reach 4 ft. 6 in. Lifting operation is by hydraulic power under finger-tip control from grader seat. Loaded bucket is tripped by manual cable control.—**Galion Iron Works & Mfg. Co., Galion, Ohio.**



Continental Warehouse Service Helps You Keep the Job Moving!

When you need suction hose in a hurry, consider the advantages of Continental's near-at-hand branch warehouse facilities. These factory warehouses, listed below, carry large stocks of hose for every requirement. They're located within reasonable telephone and delivery range. In short, they're equipped and situated to give the prompt, dependable service that helps you keep the job moving—that protects your profit in a job. Get acquainted now with Continental Warehouse Service.

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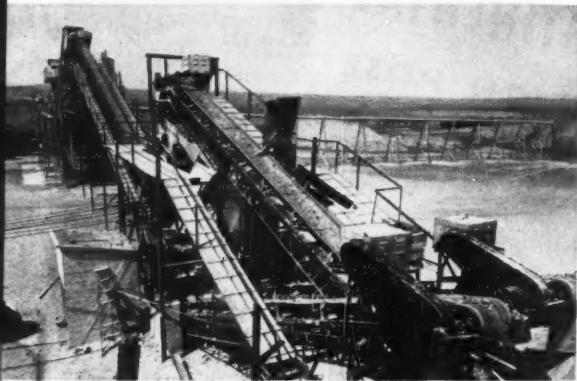
Rochester, N.Y.

St. Louis, Mo.

San Francisco, Calif.

Syracuse, N.Y.

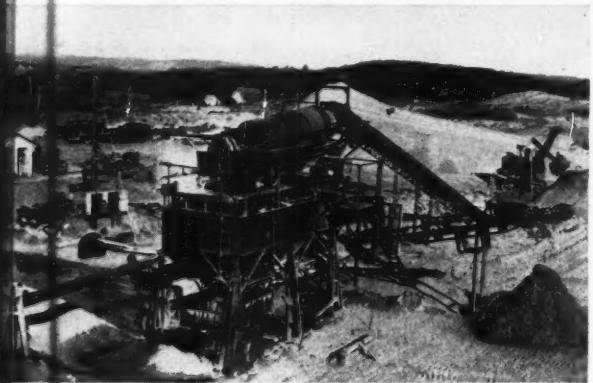
Why some men make



IN TEXAS. Tom Popplewell, president of the Panhandle Gravel Co. at Amarillo, reports this Pioneer plant produces 125 yards of sized, washed material an hour. Pioneer equipment—a 1536 Jaw, a 40x22 Roll, a 4x12 Vibrating Screen, 48" Revolving Screen, 30" Feeder and Conveyors.



IN INDIANA. The Pipe Creek Stone Company located just outside of Sweetzer produced 100-125 tons of rock an hour with its Pioneer plant. A new Pioneer Jaw Crusher recently installed will reduce oversize . . . help produce more "pay" material.



IN WISCONSIN. Baraboo Concrete Products Company at Baraboo is getting 350 to 400 yards of clean sand and 110 to 200 yards of washed sized gravel a day with its Pioneer 305-W Washing Plant. This is their second Pioneer Washing Plant.



IN TENNESSEE. In seven months Charlie Langford's Pioneer plant at Cookeville produced over 250,000 tons of road aggregate and ag-lime. His other Pioneer plant located at Gallatin has produced over a quarter-million tons of aggregate and ag-lime in one year.

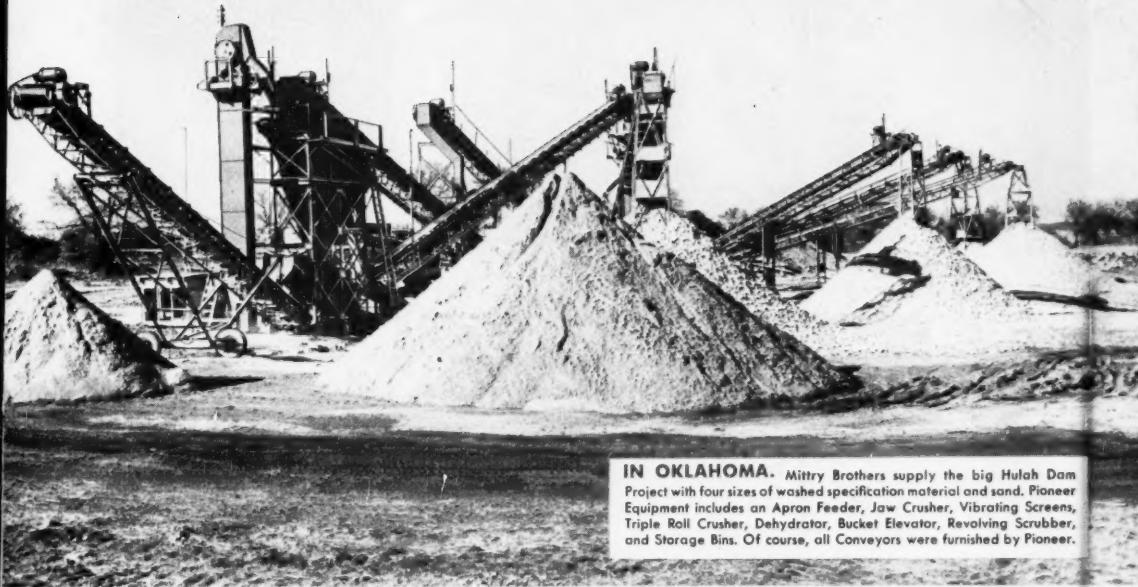


IN CALIFORNIA. Livingston Truck and Materials Co., near San Pedro, produces 300 tons of 1" minus granite an hour. Included in this big plant is a Pioneer 54 x 24 Roll Crusher, a 40 x 22 Roll Crusher, and a Pioneer 3042 Jaw Crusher.



IN ARKANSAS. The Bee Rock Quarry is producing specification rock for road construction at a 120 ton per hour clip. Pioneer equipment includes an Apron Feeder, 2036 Jaw Crusher, 40 x 22 Roll, 4' x 12' three deck Vibrating Screen, Conveyors and Storage Bins.

more money than others



IN OKLAHOMA. Mitry Brothers supply the big Hulah Dam Project with four sizes of washed specification material and sand. Pioneer Equipment includes an Apron Feeder, Jaw Crusher, Vibrating Screens, Triple Roll Crusher, Dehydrator, Bucket Elevator, Revolving Scrubber, and Storage Bins. Of course, all Conveyors were furnished by Pioneer.

BEHIND each one of these gravel and quarry plants, there's a very successful man . . . a man who has to be shown before he buys equipment.

In this space, we can show only seven such plants, owned by seven such men. But there are scores of others—in every part of the United States, in Mexico, Brazil, South Africa, Greece, the Philippines . . . all over the globe.

Why has PIONEER equipment won this world-wide acceptance and the "repeat orders" which prove its performance on the job? Because it *delivers*.

PIONEER equipment is rugged, dependable, engineered for high production with minimum upkeep. That's why so many PIONEER plants dot the landscape.

As the leading designers and manufacturers of stationary quarry, gravel and washing plants, PIONEER engineers are extremely well qualified by years of experience to help you meet competition . . . produce material at the lowest possible cost.

If you're a man who'd like to improve his competitive position . . . who is tired of costly breakdowns, we'd like to tell you about the newest features of PIONEER plants. Just mail the coupon below, and we'll mail catalogs and literature.

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| <input type="checkbox"/> Washing plants | <input type="checkbox"/> Roll Crushers |
| <input type="checkbox"/> Conveyors | <input type="checkbox"/> Vibrating Screens |

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Mass concrete of stiff consistency containing unusually large, coarse aggregate can be placed faster, more effectively and at lower cost with this vibrator. Greater density with better bond between lifts in the more economical mixes is achieved. Rugged and trouble-free, the VS-4 has a wonderful record on a host of dam projects.

JACKSON BEST CONCRETE VIBRATORS FOR EVERY TYPE OF CONSTRUCTION

To get the best vibrator for your particular job, whatever it is, see your Jackson distributor or write to us for recommendations. The complete line includes all-electric, electric and gas engine driven flexible-shaft and hydraulic models for light construction, general and mass concrete construction, street and highway paving, floors, form vibrating, product manufacture and other uses.

PORTABLE POWER PLANTS for operating vibrators, lights and tools. 1.25, 2.5 and 5 KVA capacities, equipped with permanent-magnet generators requiring no maintenance or adjustment; husky, nationally known engines. Produce both single-phase and 3-phase 60 cycle, 110 volt AC.

VIBRATORY SOIL COMPACTOR

Quickly and easily provides thorough compaction of granular soil bridge approaches, fills adjacent to walls, sub-bases of footings and concrete floors and similar granular soil compaction applications. Propels itself. Firmly compacts 10 to 15 sq. ft. of granular soil per minute to a depth of 12 inches (95% of maximum density in a single pass). Heavy duty vibratory motor. Operates from Jackson Power Plant or commercial power.

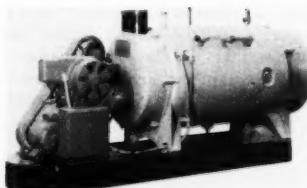
ELECTRIC TAMPER & EQUIPMENT CO.

LUDINGTON
MICHIGAN



ELECTRIC FLARE—Portable electric lantern has durable rust-proof baked enamel steel container for two standard 6-v. dry-cell batteries. Double-throw switch gives selection of either steady light or flashing flare, visible for more than 600 ft. Operates in any position. Weighs 4½ lb. and measures 5½x3x5½ in.—U-C Lite Mfg. Co., 1050 W. Hubbard St., Chicago 22, Ill.

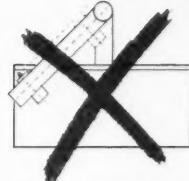
CAR THAWER—Unit is designed to thaw cold, frozen gravel or sand in steel railroad cars, thus facilitating unloading them and eliminating demurrage charges. Car thawer is made of welded steel construction and weighs about 60 lb. Applies heat to entire width of car in one operation enabling materials to flow freely. Uses waste No. 2 fuel oil or kerosene in trough.—J. C. Corrigan Co., Inc., 41 Norwood St., Boston 22, Mass.



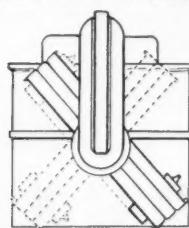
HOT WATER GENERATOR—Automatic oil or gas-fired models in two sizes, 665 gal. and 875 gal. per hr. at 100-deg. F. temperature rise. Four-pass construction of shell insures high efficiency within thick insulation jacket. Large unit measures 113x44x26½ in. Generator shell including tubes is galvanized. Refractory-lined rear door provides access for cleaning and maintenance.—Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.

DELTA
MILWAUKEE®

Model 50A



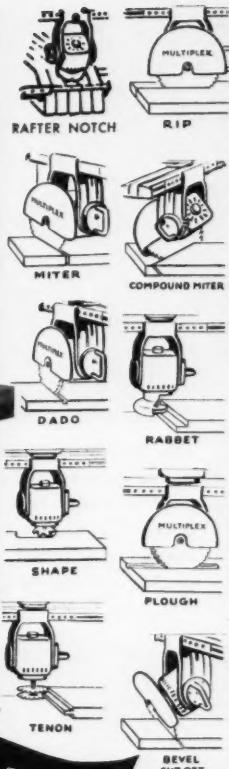
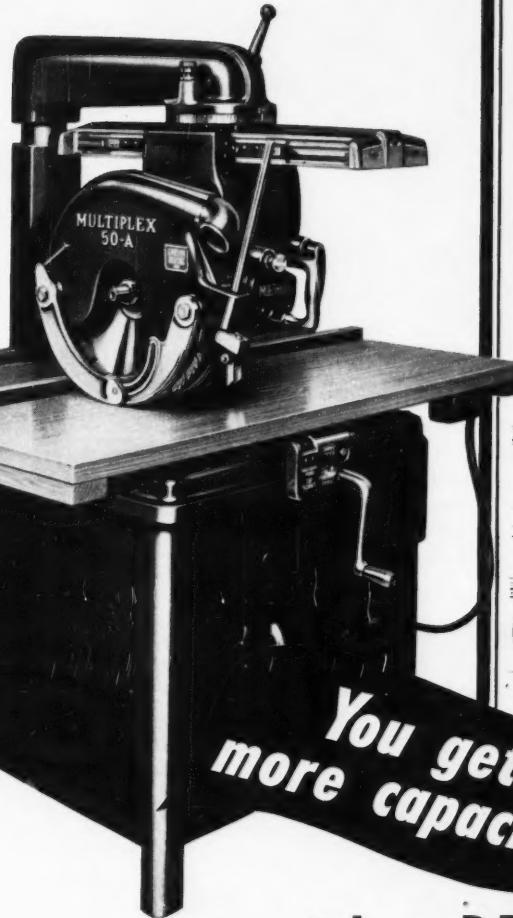
The Old, Conventional Principle
This shows how conventional radial-arm saws pivot from the column. They have practically no mitering capacity at 45°, not much usable capacity at 30°, and almost none beyond 15° on left-hand miters.



The Modern, Delta Multiplex Principle
This shows how Delta Multiplex to set quickly to any angle from 0° to 90°. The saw rotates through 360°. Permits unlimited number of saw positions, greater capacity, and ease of operation.



Look for the name
of your Delta
distributor under
"Tools" in the
classified section
of your telephone
directory.



...with a **DELTA®**

Multiplex Radial-Arm Saw

Cutting arm rotates 360°. You can put it at any angle — and get 100% mitering capacity.

It's quick and easy to make almost any cut you want, with a Delta Multiplex Model 50-A. The patented "Versatile Elbow" sees to that. It's a center-suspended track that carries the cutting head and lets you put the blade in any position.

A movable table permits full usable travel of cutting head in any cross-cut, miter, or rip position. Together with the "Versatile Elbow," this table gives you greater capacity. You cut full-length miters — right-hand — and left-hand from 0° to 90°!

Delta Multiplex Model 50A uses a standard 16" blade, although a 20" blade can be used. This machine has a rip capacity up to 6". It is available with a 3, 5, 7½, or 10 h.p. motor.

Your nearby Delta distributor has the 50-A on his sales-floor now. Inspect it there. See

the Delta Multiplex features that assure you of safety, speed, convenience and economy.

Ask your Delta distributor about getting a Delta Multiplex Radial-Arm Saw on easy credit terms.

Send coupon for Bulletin AD-444.

DELTA MANUFACTURING DIVISION
ROCKWELL MANUFACTURING COMPANY
MILWAUKEE 1, WISCONSIN

Tear out coupon and mail today!

DELTA MANUFACTURING DIVISION
3808 N. Pierce Street
Milwaukee 1, Wisconsin
Send me free copy of Bulletin AD-444.

Name _____
Title _____
Company _____
Address _____
City _____ (_____) State _____
RS-12

This International TD-18 Diesel Crawler and matched 10-yard scraper is improving a 2-mile stretch of farm-to-market road for its owner—Wayne County, Nebraska, County Highway Commission. The TD-18 is digging ditches, sloping banks and leveling roadway.



CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

INTERNATIONAL





CO\$T-CON\$CIOUS COUNTY COMMISSIONERS *Choose* INTERNATIONALS

Stretching county road construction and maintenance money to do the job takes a bit of doing. That's why cost-conscious county highway commissioners select International tractors and International-powered road machines. International's power-packed performance for every penny of fuel consumed pays off in work done. That means more earth moved and more miles of road built for every dollar invested.



International tractors and engines are built to stand up under the

roughest going—to give you more for your money. Contractors and county boards alike, are finding Internationals pay for themselves in a hurry and then continue to pay dividends for a long time to come.

It's good to know your International Industrial Power Distributor is always on hand to help you select International equipment for your needs and to service your equipment, keeping it in top-notch operating order.

INTERNATIONAL HARVESTER COMPANY
Chicago

Listen to James Melton on "Harvest of Stars" every Wednesday evening—CBS



Industrial Power





Choose the Leader . . . For VALUE! CHEVROLET ADVANCE-DESIGN TRUCKS



From one end of the nation to the other, more truck users buy Chevrolet trucks than any other make. Chevrolet trucks offer more of what truck users want—more power combined with economy . . . more comfort and convenience . . . greater ease of handling . . . more value from start to finish! And to all these advantages you can add the biggest premium of all—3-WAY THRIFT! Here's the one truck that combines low cost operation, low cost upkeep and the *lowest list prices in the entire truck field!*

CHEVROLET MOTOR DIVISION, General Motors
Corporation, DETROIT 2, MICHIGAN

Chevrolet Trucks alone have all these features

Chevrolet's 4-SPEED SYNCHRO-MESH TRANSMISSION offers quicker, quieter and easier operation in Series 3800 and heavier duty trucks. Faster shifting maintains speed and momentum on grades.

Chevrolet trucks have the famous CAB THAT "BREATHES"*. Outside air is drawn in and used air forced out! Heated in cold weather.

Chevrolet's power-packed LOAD-MASTER ENGINE provides improved durability and efficiency in Series 5000 and 6000 models as well as the world's greatest economy for its size!

Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB,

cushioned on rubber against road shocks, torsion and vibration.

Chevrolet's exclusive SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

Uniweld, All-Steel Cab Construction
• Large, Durable, Fully-Adjustable Seat • All-Round Visibility with Rear-Corner Windows* • Heavier Springs • Super-Strength Frames • Full-Floating Hypoid Rear Axles in the 3600 Series and Heavier Duty Models • Specially Designed Brakes • Hydrovac Power Brakes in Series 5000 and 6000 Models • Standard Cab-To-Axle Length Dimensions • Multiple Color Options.

*Heating and ventilating system and rear-corner windows with de luxe equipment optional at extra cost.

CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!

ELECTRIC HOISTS—New line of Speedway electric hoists includes capacities from 1,000 to 20,000 lb. Design incorporates all-steel construction and gear train, plus Trulay preformed cable and swaged-on cable fittings. Other construction features are ball bearing, fully enclosed motors, splined connections, grooved steel cable drum, jaw-type brake, pushbutton controls, Hyatt roller bearings and safety limit stop. —**American Chain & Cable Co., Inc.**, (Wright Hoist Division), York, Pa.

EARTHMoving EQUIPMENT—Three new models of Wooldridge cable-controlled earthmoving equipment are in production. These include two four-wheel scrapers and one bulldozer. Scrapers have struck capacities of 8.5 cu.yd. and 12 cu. yd. New scrapers, with unobstructed front apron opening of 60 in., feature rear-draft fulcrum leverage and pivot-tilt bowl to assure faster, more efficient loading and dumping of greater volume. Other engineering advances include higher yoke clearance and greater ruggedness throughout. Cable is easily accessible and reeved in straight lines without reverse bends for increased life and easy replacement. Shorter wheelbase insures quick turning in crowded quarters. All sheaves are mounted away from dirt and load. New bulldozer is designed for rugged service on Allis-Chalmers big HD-19 tractor. Moldboard of $\frac{1}{2}$ -in. plate is heavily gusseted to withstand great abuse. Shipping weight of blade is 8,200 lb.; its removable tips are of 1-in. manganese-molybdenum alloy.—**Wooldridge Mfg. Co.**, Sunnyvale, Calif.



ELECTRODE FOR WELDING CAST IRON—New electrode called Soft-weld is for depositing dense, soft machinable welds in gray-iron castings. It is a non-ferrous electrode and operates with a soft, steady arc on either alternating or direct current. The entire weld area may be drilled, machined, sawed or tapped with ease. Recommended for use both in original manufacture, as well as for repairing broken or defective castings and correcting machining errors. Available in 14-in. length in 1.8- and 5.32-in. sizes, packaged in 10-lb. containers.—**Lincoln Electric Co.**, Cleveland 1, Ohio.

Viber Company has long recognized the destructiveness of steel vibrators on many popular form lining materials.

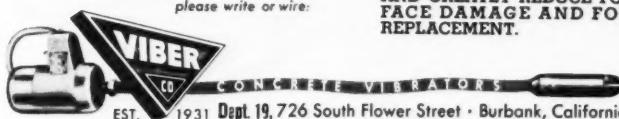
Realizing that damage to Celotex, plaster or Paris inserts for architectural concrete and plywood is expensive, they studied the possibility of using RUBBER TIPPED VIBRATORS.

After critical tests on many large concrete construction jobs, it was found that the new VIBER RUBBER TIPPED VIBRATORS greatly reduced form costs.

Available in three standard VIBER sizes:



*For additional information
please write or wire:*



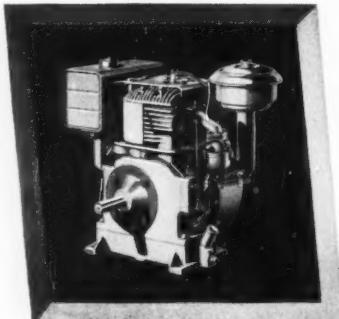
Made of high quality live rubber, Viber's Rubber Tipped Vibrators are built to withstand extreme punishment (the same rubber used to make automobile tires).



New style housing with replaceable rubber tips may be used in place of one-piece steel housing. Rubber tips are easily replaced. Simply unscrew worn part and install new tip.

VIBER RUBBER TIPPED VIBRATORS MINIMIZE GRINDING AND GREATLY REDUCE FORM FACE DAMAGE AND FORM REPLACEMENT.

If You Have a Gasoline Engine Power Problem



*"Preferred"
Air-Cooled Power*

Briggs & Stratton offers you advantages no other manufacturer of single cylinder, air-cooled engines in the world can match.

These are the engineering skill, knowledge, and counsel as well as the unequalled performance that come from 30 years of experience — plus the advantages of a world-wide service organization. That extra experience, that extra skill assures you the best in design, materials, workmanship, and precision production.

This experience is yours for the asking. Our engineers are ready to counsel with you to help solve your gasoline engine power problems.

BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U. S. A.



HEAVY-DUTY GLOVE—Made of specially treated chrome tanned cowhide for long wear, the glove has a canvas back with elastic strap to overcome hand fatigue while providing a cooler feeling and snug fit. All necessary seams are steel-sewed and the seam along the forefinger has been eliminated. Glove has a short cuff with tape binding.—American Optical Co., Southbridge, Mass.

BLUE STRUCTURAL GLASS—Sky blue is a new color of Vitrolite structural glass, bringing to ten the number of colors now available. Recommended as pleasing for interior wall surfaces in residences and public buildings, this product is being made in 11/32-in. thickness with a fire polished surface. Colors do not fade or show wear and surface will not absorb liquids.—Libby-Owens-Ford Glass Co., Nicholas Building, Toledo 3, Ohio.

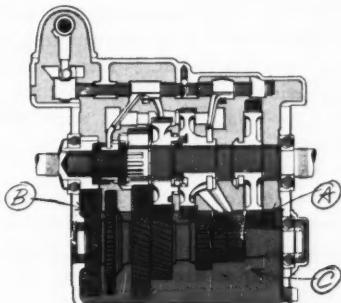


INDUCTION MOTORS—New line of extra low starting kva. squirrel-cage induction motors is available in flange-mounted type and coupled two-bearing type for direct coupling to 514, 600 and 720 rpm. air compressors. Design permits full-voltage starting. Sizes range from 60 to 250 hp.—Electric Machinery Mfg. Co., Minneapolis 13, Minn.

STANDARD ENGINEER'S CASE FILE



Case 1129—Stopping Lube Leaks in Heavy-Duty Gears



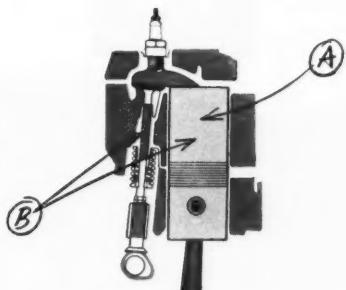
HEAVY-DUTY TRANSMISSION

Because compounded RPM Gear Lubricant will not foam, it eliminates a common cause of leakage from gear cases on trucks and other machines working in extreme conditions of temperature and load. Comes in four grades: SAE 80, 90, 140, 250. For spur, spiral and automotive worm gears. (For hypoids, use RPM Multi-Service Gear Lubricant.)

- A. Contains foam inhibitor — prevents retention of air whipped into lubricant by rotating gears; breaks bubbles that form.
- B. Oiliness compound helps provide tough lubricating film — withstands shock and overloads.
- C. High resistance to oxidation prevents formation of deposits; assures lubrication in extreme temperatures.

The stability and high lubricating qualities of RPM Gear Lubricant (Compounded) provide outstanding lubrication for bronze worm gears.

Case 1117—Preventing Starting Wear in Gasoline Engines



GASOLINE ENGINE PISTON AND VALVE

Engines lubricated with RPM Motor Oil had a film of oil on cylinders, valve stems and other parts at all times, even when idle. The film provided lubrication from the instant the engines started to turn over. Recommended for all gasoline engines. Comes in seven grades: SAE 10/10W to SAE 70.

- A. Special compound keeps lubricant on hot or cold metal — reduces wear and protects against corrosive moisture in engines.
- B. Detergent cleansing agent loosens carbon, gum and lacquer from all parts . . . keeps rings free. Contaminants stay dispersed in the oil and flow out with drainings.

RPM Motor Oil contains other compounds which prevent corrosion of any bearing metal, resist oxidation and stop foaming.

For additional information and the name of your nearest Distributor, write

**STANDARD OIL COMPANY
OF CALIFORNIA**

225 Bush Street, San Francisco 20, California

The California Oil Company
Barber, New Jersey

The California Company
17th and Stout Streets, Denver 1, Colo.

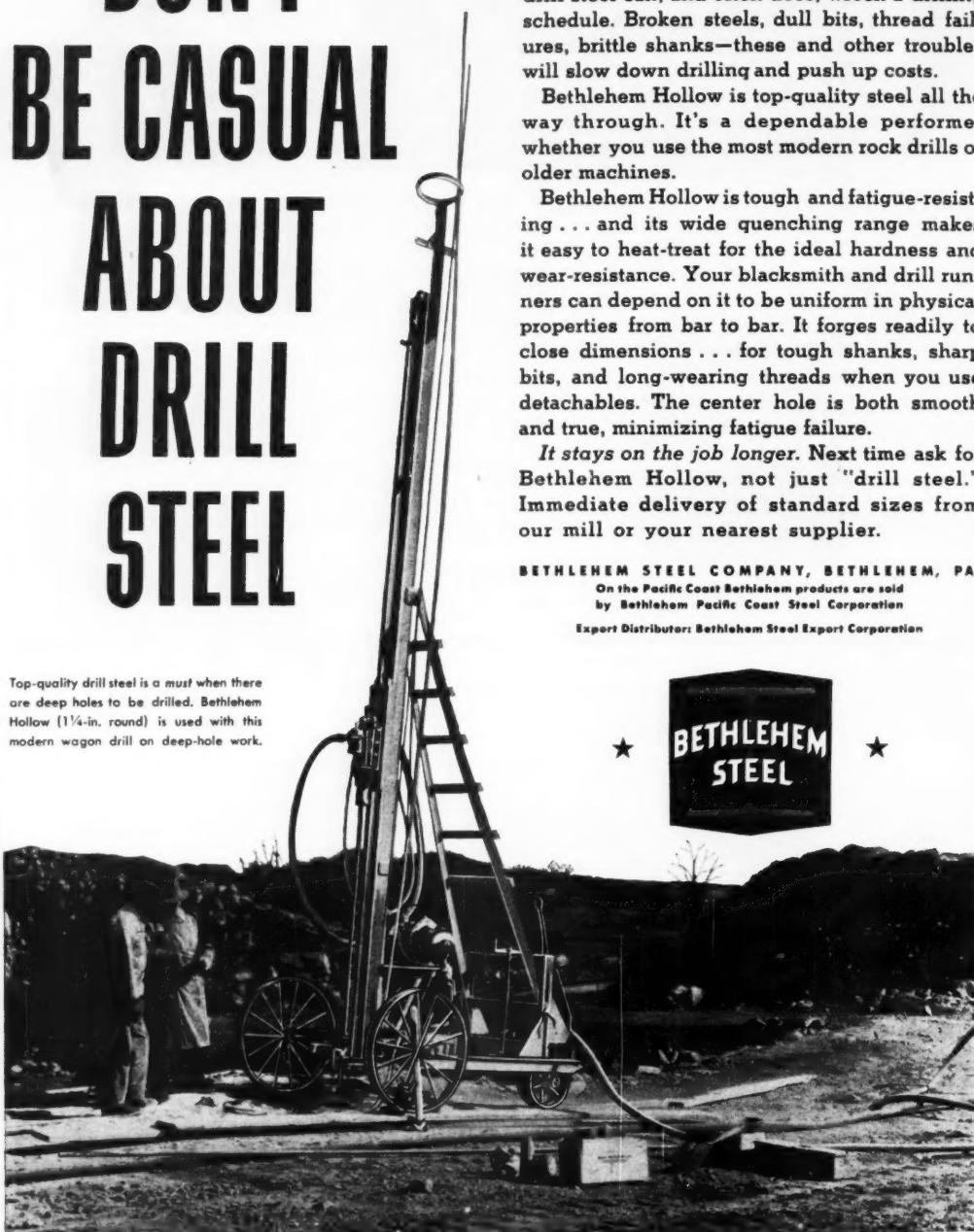
Standard Oil Company of Texas
El Paso, Texas



Trademarks Reg. U. S. Pat. Office

DON'T BE CASUAL ABOUT DRILL STEEL

Top-quality drill steel is a must when there are deep holes to be drilled. Bethlehem Hollow (1½-in. round) is used with this modern wagon drill on deep-hole work.



Buying "just drill steel" involves the risk of losing many of the advantages provided by modern compressors and rock drills. A poor-quality drill steel can, and often does, wreck a drilling schedule. Broken steels, dull bits, thread failures, brittle shanks—these and other troubles will slow down drilling and push up costs.

Bethlehem Hollow is top-quality steel all the way through. It's a dependable performer whether you use the most modern rock drills or older machines.

Bethlehem Hollow is tough and fatigue-resisting . . . and its wide quenching range makes it easy to heat-treat for the ideal hardness and wear-resistance. Your blacksmith and drill runners can depend on it to be uniform in physical properties from bar to bar. It forges readily to close dimensions . . . for tough shanks, sharp bits, and long-wearing threads when you use detachables. The center hole is both smooth and true, minimizing fatigue failure.

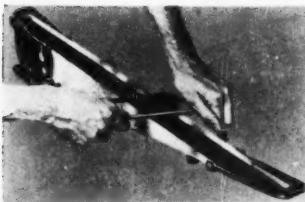
It stays on the job longer. Next time ask for Bethlehem Hollow, not just "drill steel." Immediate delivery of standard sizes from our mill or your nearest supplier.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold
by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM HOLLOW DRILL STEEL



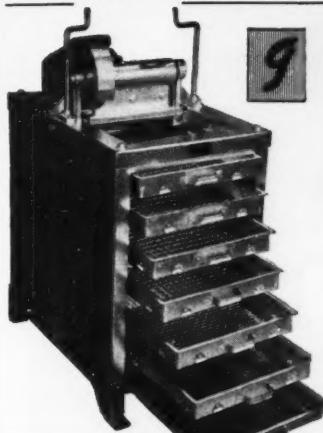
SAW CLAMP—Grips entire length of hand saw up to 30 in. Designed to make filing easier and faster as operator can work from heel to tip without shifting saw. Gripping edges of all-steel clamp are ground to hold saw true to eliminate all vibration.—Speed Corp., 2025 Sandy Boulevard, Portland, Ore.

RUNWAY LIGHT—Designed to exceed every requirement of CAA specification L-819 and Army Air Force Specification No. 32957, a new, type BHI, low-cost bi-directional, high-intensity runway light is announced. New unit mounts on the same base as older units. Two main beams are formed by duplicate double-lens assemblies from a single lamp. Color is provided by inner lens so that there are no colored lenses exposed to rain or snow. Controlled, uniform fill-in light across the runway and on the side away from the runway is provided from the same lamp by prismatic panels on the sides of the unit, which uses a 200-watt, 6.6-amp. aviation lamp No. 6.6, A/T 14P with medium pre-focus base. Special low-loss transformers are available complying with CAA Specification L-806 that can be installed in any Westinghouse type AN base or in any AN type deep base.—Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.



METRIC-SIZE OPEN-END WRENCHES—Ten new Proto open-end wrenches with metric-size openings are available for use of mechanics who maintain foreign-made equipment. Wide range of size makes wrenches suitable for Italian and French automobiles and other types of equipment made in Europe. Wrenches are forged and have smooth shanks and polished heads. Opening size combinations, in millimeters, range from 6x7 to 24x26.—Plumb Tool Co., Los Angeles 54, Calif.

FOR IMPROVED OPERATING EFFICIENCY



8 GILSON FEATURES

1. Makes test quickly and accurately
2. Two to seven separations simultaneously
3. Screen trays independently removable
4. Trays balanced to same tare weight
5. Visible separation to refusal
6. Few moving parts
7. Sturdy construction
8. Size range 4" to 200-mesh

GILSON Mechanical Testing Screen

• Here's a machine designed for the efficient sizing of crushed stone, gravel and slag test samples. It accommodates samples up to one cubic foot, making from two to seven separations simultaneously, in five minutes or less.

Smaller amounts of very fine materials may be handled efficiently and the screen used for research or other special mass separation jobs down to 100 mesh or finer.

Where exacting specifications are required the Gilson Screen eliminates guesswork—avoids errors—reduces operating delays and produces a controlled truly guaranteed product. For fast accurate sizing of coarse or fines from 4" to 200-mesh specify a Gilson Testing Screen.

GILSON SCREEN CO.

BOX 186
MERCER, PENNA.

BIGGER PAYLOADS with WELLMAN *Williams Type* BUCKETS

• Exclusive features in design and construction make payloads bigger... at lower cost! Weight is balanced, not cumbersome. Extra strength is built into every part with the sturdy welded rolled steel construction pioneered by Wellman, the leader for over fifty years. A type for every service!

THE WELLMAN ENGINEERING COMPANY
7017 CENTRAL AVENUE • CLEVELAND 4, OHIO

SEND FOR
BULLETIN





WHEN IT'S A BIG TOUGH ROAD JOB...

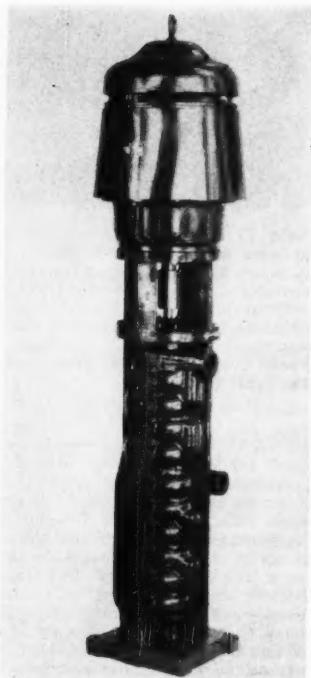
... you need WICO's dependable spark

Whether it's in desert or swamp (and you have to make a surface like a pool table), you haven't time to worry about equipment accessories. On a city job like this speed is always important. So here, too, you need machinery that will always finish the work — and more!

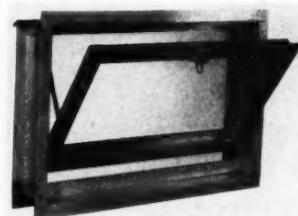
Barber-Greene equipment with a tough engine and a WICO magneto is a combination hard

to beat. Whatever you use, make sure before you buy it that the spark will be reliable — by insisting on WICO ignition. And when you replace, ask for WICO. It's the best buy for contractors' equipment.

Trained field engineers and more than two thousand authorized service stations serve WICO users everywhere. Wico Electric Company, West Springfield, Massachusetts.

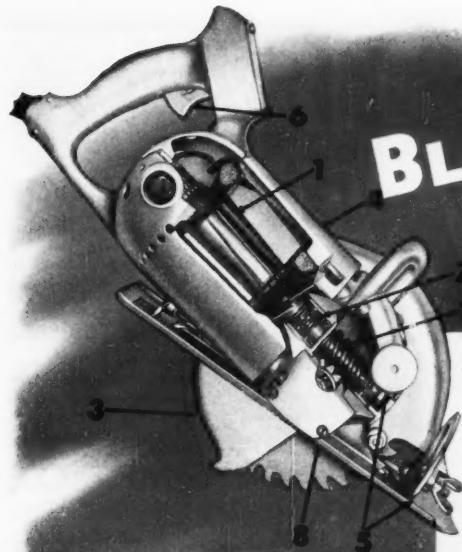


VERTICAL CENTRIFUGAL PUMP
—Hydroplex vertical pump is designed for high-pressure, low-volume pumping. Capacities range from 10 to 140 gpm, and heads range from 450 to 1,700 ft. Standard drive is a direct-connected three-phase, 220-440-v. vertical electric motor. Operating speed is 3,550 or 2,950 rpm. Balance of axial thrust forces is achieved by opposed grouping of impellers.—**Byron Jackson Co., Terminal Annex Box 2017, Los Angeles 54, Calif.**



WINDOW FOR GLASS BLOCK OPENINGS — Ventilating window for glass block openings is of stainless steel tubular construction designed for ample strength to support load. Rugged latch insures positive metal-to-metal double seal at all times. Window has double weathering on heads, jambs and sills. Made in stock sizes for 8-in. glass block.—**Modern Electric Laboratory, 6131 S. Wentworth Ave., Chicago 21, Ill.**

BLACK & DECKER QUALITY *in the SAW...*



**... SLASHES
SAWING TIME
on the JOB**

The work you get out of tools depends on what's built into them!

That's why thousands of builders swear by quality-built Black & Decker Electric Quick-Saws.* They'll save you time and money—ripping, cross-cutting, angle-cutting, grooving, dadoing—in wood, metal, stone and compositions—ten times faster than hand sawing. Easy to change blades and discs. Operate on any standard power line or portable generator. See your nearby B&D Distributor for popular-size 7" Quick-Saw, at \$115.00; the close-coupled 8" Quick-Saw, at \$135.00, for cut-off operation; the 9" Quick-Saw, at \$150.00, for heavier cuts. Write for free catalog to: The Black & Decker Mfg. Co., 659 Pennsylvania Avenue, Towson 4, Maryland.

*Trade Mark Reg. U. S. Pat. Off.

LEADING DISTRIBUTORS  EVERYWHERE SELL

Black & Decker

PORABLE ELECTRIC TOOLS



**BLACK & DECKER
QUICK-SAW ARM \$148.00**

Doubles the usefulness of your Portable Electric Saws! Helps you do radial as well as portable sawing with the same tool. Greater accuracy. Less operator fatigue. All three B&D Quick-Saws (and most other makes) fit into the adjustable carriage in a jiffy.

FOR BETTER HOSE SERVICE... Use These Widely Adaptable DIXON PRODUCTS!



"AIR KING" Quick-Acting, Universal Type

HOSE COUPLING

Famous for reliability and safety on indoor or outdoor air tool jobs. Quickly connected, and leakproof under both pressure and vacuum. Plain design—no parts to get out of order. Corrugated hose shanks are extra long. All locking heads—male and female, shank and threaded—are same size, in all hose sizes up to 1". Malleable iron (cadmium plated) or bronze.

PATENTED LOCKING ARRANGEMENT

For positive safety in services involving excessive twist or vibration. Connecting ends are fastened together in such a way that they cannot come apart until locking device is removed.



"DIXON"

SWIVEL CONNECTION

Turns freely with the hose under all conditions—the result of an entirely new principle of design and construction. Prevents twisting and kinking in lines carrying air, water, hydraulics, etc. Requires no lubrication or adjustment. For end or intermediate connections. Leakproof under all normal working pressures. Made in cadmium plated steel, in $\frac{1}{2}$ " and $\frac{3}{4}$ " I.P.T. sizes. Adaptable to "Air King" and other standard hose couplings.

Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.

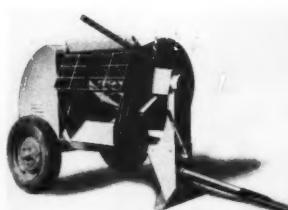
IF IT'S A **DIXON** PRODUCT

IT'S DEPENDABLE

DIXON
VALVE & COUPLING CO.
Main Office and Factory: PHILADELPHIA, PA.
Branches: CHICAGO BIRMINGHAM LOS ANGELES HOUSTON



DRAG CLAMP—Gripping clamp has one-piece jaw frame mounted on heavy shoe which acts as a skid for easy movement of cumbersome sheets, plates and flat stock. Sheet slipped between jaws of clamp is automatically gripped.—**Merrill Bros., Arnold Ave., Maspeth, L. I., N. Y.**



PLASTER MIXER—Machine of 6-cu.ft. capacity is driven by Briggs & Stratton engine through a heavy roller, chain-driven, and is equipped with a bag shelf and a bag splitter. Fabricated of steel throughout, with disk type wheels, Timken bearings and pneumatic tires. A telescopic towing bail is provided.—**Muller Machinery Co., Metuchen, N. J.**



MATERIAL HAULER—Tournahauler is a vehicle designed to haul long, heavy loads such as pipe, timber, steel, etc. Extra large low pressure tires afford flotation in soft, difficult ground conditions encountered in off-road hauling. Electric power steer permits full 90-deg. turn of Tournapull in relation to the rig.—**R. G. LeTourneau, Inc., Longview, Texas.**

TWO NEW STRONG MEN FOR HEAVY HAULING

Built with still more guts than our Standard Model SELF-LOADING FLOAT, which is rated as 50,000 lbs. and regularly walks off with much more, these new, huskier models are rated at

75,000 LBS. - 100,000 LBS.

They are built to stand any test your common sense puts them to. You'll want to know more about these new huskies, built as only Hobbs builds Trailers.

Write, wire, phone for details.

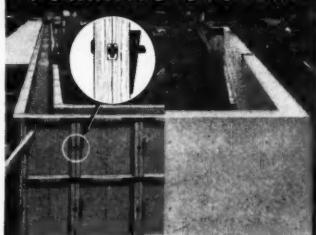
HOBBS MFG. CO.

Fort Worth, Texas, Dept. M



Sales and Service at
Houston, Lubbock,
San Antonio, Dallas
Fort Worth

SYMONS FORMING SYSTEM



SAVES TIME

Inset shows how Symons System saves time in erecting and stripping forms. Bolt passes through 2 x 4 studs and tie loop. Wedge secures the assembly. This simple device cuts forming time 50%.

SAVES LABOR

Harry G. Dehring, Foreman, Taylor Brothers, South Bend, Ind., states "Seven men set up the forms for a 26' x 27' foundation in one hour and fifteen minutes."

SAVES COST

With Time and Labor cut in two . . . Plus savings in nails, spacers, washers and bracing . . . Plus for greater reuse of forms . . . Costs drop to a new low.

RENTED WITH PURCHASE OPTION

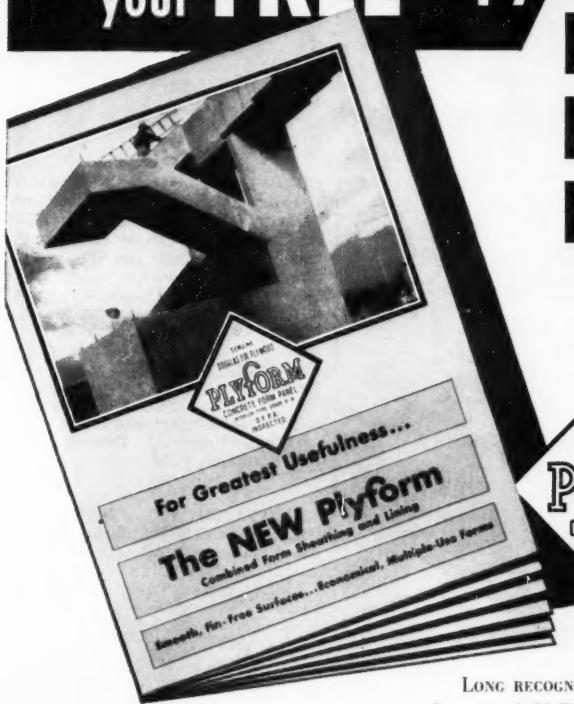
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Helpful, NEW
PLYFORM
Booklet—detailling the
NEW PlyForm
Grade and its
uses**



Facts About the NEW PlyForm

- A grade of Interior-type plywood, PlyForm is bonded with highly moisture-resistant, but **not** waterproof glues.
- Specifications demand that PlyForm withstand several cycles of wetting and drying without failure.
- Both faces of PlyForm, of "B" quality veneer, are smooth and solid... free from open defects.
- PlyForm specifications require that inner plies be of "C" veneer in which there is strict limitation of wood characteristics such as small knotholes... this to give maximum serviceability for rugged use.
- PlyForm is sanded on both faces to give a smooth, fin-free surface. PlyForm continues to be mill-oiled (unless otherwise specified), and edges are sealed.

LONG RECOGNIZED as the outstanding re-usable concrete form panel, PlyForm is now produced to meet new specifications set forth in U. S. Commercial Standard CS45-48, effective November 1, 1948. The new booklet details the new grade and its uses, including a full report of laboratory and field tests which prove the new grade to be a superior concrete form material.

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*Real
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Tacoma 2, Washington

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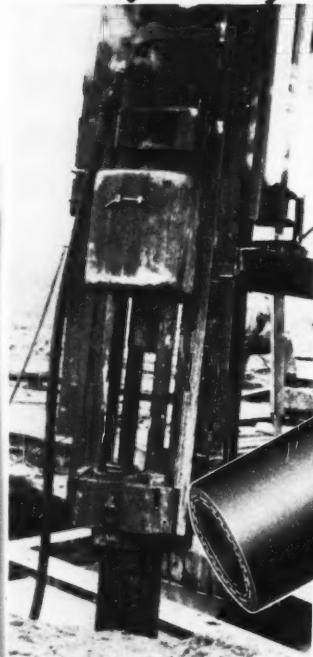
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A Goodall "Standard of Quality" product, for pile driving and all other heavy-duty steam jobs, at pressures up to 200 lbs. and superheat steam temperatures to 400° F. Made in sizes $\frac{1}{2}$ " to 2", I.D., in maximum lengths of 50 feet.

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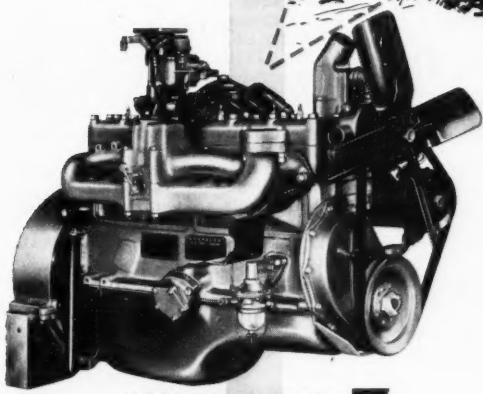
CORRUGATED METAL SHEAR—Used either on the job, on the roof or in the shop, new shear cuts corrugated metal without damage to corrugations. Cuts can be made crosswise, lengthwise or diagonally. Device makes a clean straight cut in form of a $\frac{1}{8}$ -in. slot of any length. Shear weighing 15 lb. may also be used to cut metal lath, sheet metal and corrugated asbestos. Strong extension handle gives ample leverage for any cutting job and may be removed for compact storing or easy carrying.—Universal Product Co., San Francisco, Calif.

GEAR LUBRICANT—Geartek is a liquid gear shield for lubricating exposed, open and partially inclosed gears. Applicable to wire rope, cables, rack teeth and dipper handle racks of excavating and industrial machinery, hoists and other equipment. Can be applied with brush or swab or may be poured directly on gears. Heating prior to application is not required. Lubricant sets to an almost dry film which is extremely adhesive and is not thrown off the gears even at high speeds. Does not become brittle or solidify at temperatures below zero. Available for delivery in containers ranging in size from 1-gal. cans to 40-lb drums.—Pennsylvania Refining Co., Cleveland 4, Ohio.



AUTOMATIC LINE OILER—Protects against running rock drills or other compressed air equipment without adequate lubrication. Delivers carefully metered flow of atomized oil from any position, either vertical or horizontal, and shuts off the line air automatically when all oil in the reservoir has been used. Oil capacity, one pint. It is not necessary to shut off the line air or to stop the machine to which it is attached in order to refill the reservoir.—Gardner-Denver Co., Quincy, Ill.

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DAY'S
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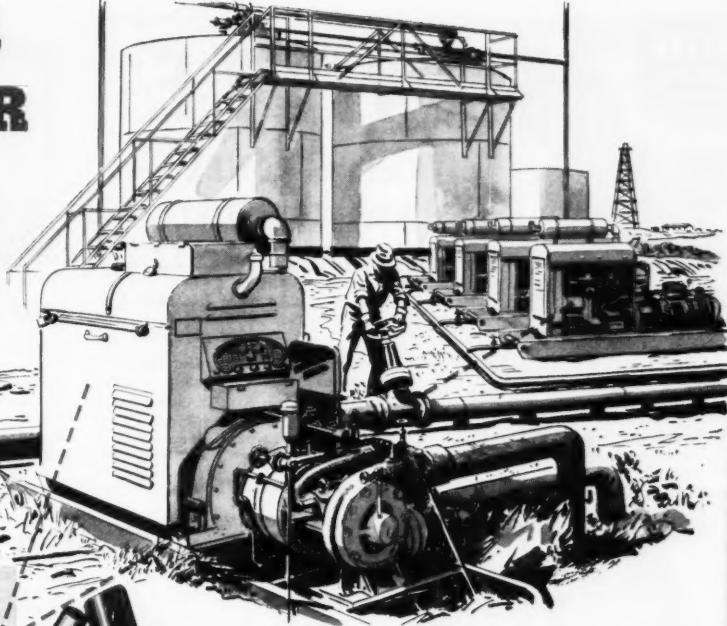


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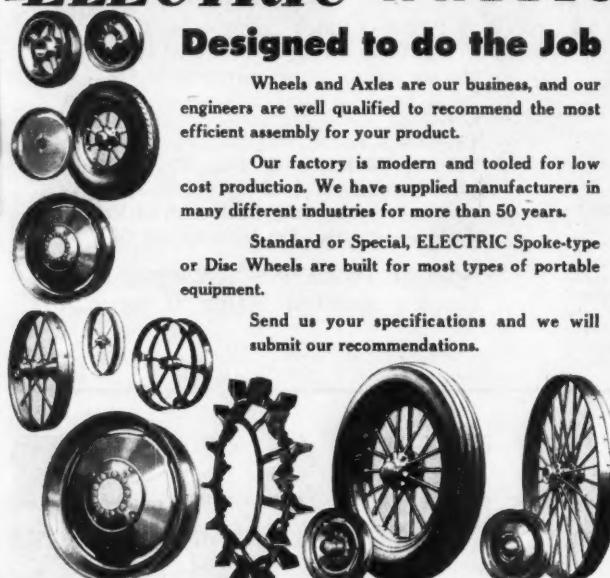
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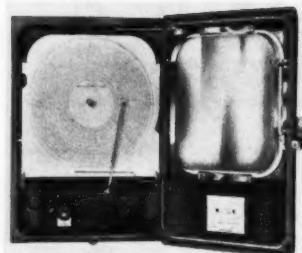
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TILT TYPE TRAILER—Designed to enable trailer and flat-bed truck to be loaded with equipment in less than 12 min. without use of special loading ramps. Three special features are: Automatic cribbing brakes to prevent movement of trailer while loading; automatic hydraulic tilting control cylinder for tilting trailer bed gently under loads, and loading-aid hooks in recesses on truck bed to help in moving equipment across the trailer to the truck bed. Trailer is available in two types, tandem and single axle.—**Foster Trailer Co., 2029 Sacramento St., Los Angeles 21, Calif.**



PORTABLE ELECTRIC DRILL—New Hole-Shooter is available in three drill size capacities of $\frac{3}{8}$, $\frac{5}{16}$ and $\frac{1}{4}$ in. Tool weighing $3\frac{1}{2}$ lb. is equipped with ac. or dc. universal-type motor for standard 115-v. electric current. Removable inspection plate, held by only two screws, enables drill to be examined and cleaned readily. Over all length is $7\frac{3}{4}$ in. Switch controlling drill is contained in pistol grip.—**Milwaukee Electric Tool Corp., 5344 W. State St., Milwaukee 8, Wis.**

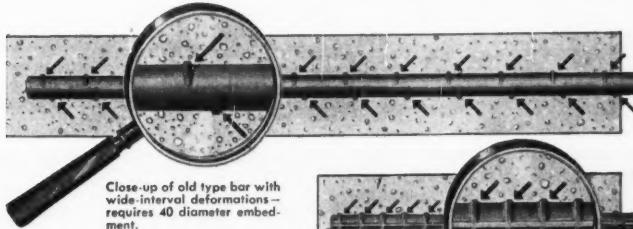


PORTABLE CONVEYOR—Hydraulic hoist lifts conveyor as high as 21 deg. in 10 min., and it may be

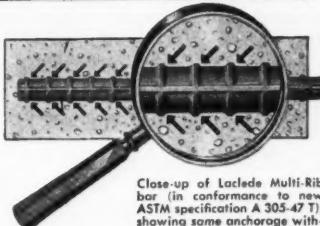
lowered to traveling position in 1 min. Available in lengths of any multiple of 4 ft. with a minimum of 32 and a maximum of 52 ft. in the channel frame and of 60 ft. in the lattice frame. Widths range from 18 to 30 in. Equipped with anti-friction bearings throughout and with a 24-in. belt take-up on tail pulley. Self-cleaning tail pulley and belt scraper provide double protection for return belt. May be driven from gas, diesel or electric power. Balanced mounting makes it possible for one man to lift conveyor to truck hitch.—Universal Engineering Corp. (A division of Pettibone Mulliken Corp.), Cedar Rapids, Iowa.

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This rugged hammer is readily adapted to driving wood, concrete or pipe piles, steel sheeting or H beams. It fits the same leads, uses the same accessories as the Warrington-Vulcan Single-Acting Pile Hammer.

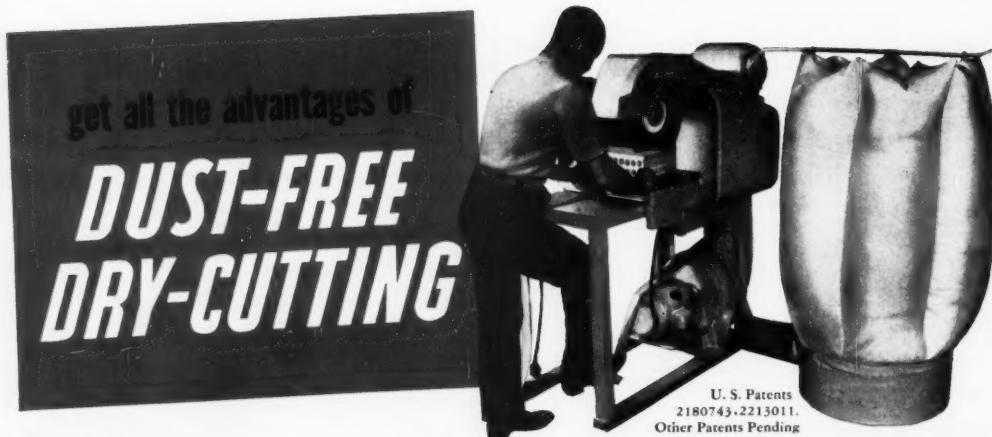
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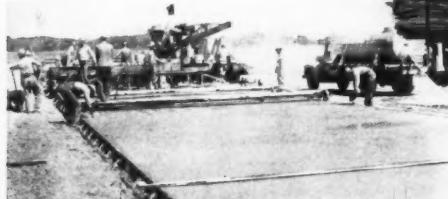
MARTIN FIREPROOFING CORPORATION, 2120 Military Road, Buffalo 17, N.Y.

Mechanical Dowel AND TIE-BAR INSTALLER

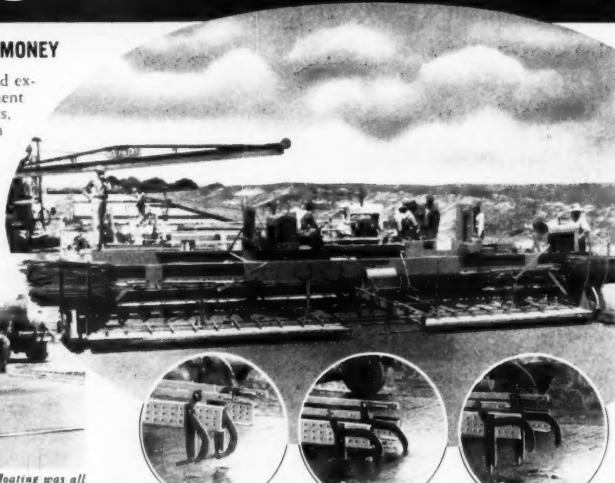
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Note smooth pavement surface after installation. Regular floating was all that was required.



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WARREN OHIO

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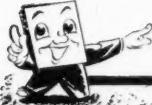
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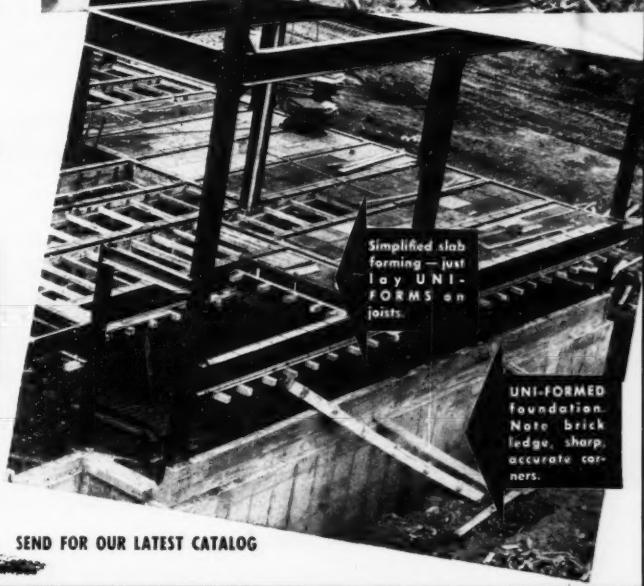
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MOTOR TRUCKS—(20-p. folder) Describes special features in broad line of trucks and gives specifications and applications for each unit. Outlines complete information on both gasoline and diesel powered units of both conventional and six-wheeler design. — **Federal Motor Truck Co.**, 5780 Federal Ave., Detroit 9, Mich.

TUNNEL LINER PLATES—(4-p. folder) Tells how use of lightweight corrugated metal liner plates has simplified tunneling procedure. Table gives physical properties of Armco corrugated tunnel liner plates available for curved diameters from 48 to 400 in. Gages range from No. 14 to No. 3.—**Armco Drainage & Metal Products, Inc.**, Middletown, Ohio.

COOLANT CIRCULATING PUMPS—An 8-p. bulletin tells all about Allis-Chalmers foot mounted, submerged and side-wall mounted coolant circulating pumps. Construction details and application information are supplied for each of the eight types, together with dimensions, head capacity, motor frame, pipe friction and valve and fitting flow resistance tables. — **Allis-Chalmers Mfg. Co.**, 1018 S. 70th St., Milwaukee, Wis.

HAULING SCRAPERS—(16-p. booklet) Titled "Caterpillar Scrapers at Work", this publication deals with problems of earth moving. Describes loading, hauling and spreading jobs done by scrapers with diesel track-type tractors. Numerous photographs illustrate typical applications. — **Caterpillar Tractor Co.**, Peoria, Ill.

DRY MATERIAL WEIGHING—Bulletin describes the new Builders Conveyoflo Meter for continuously weighing and totalizing the flow of dry materials. It also is used for automatic proportioning and controlling of dry or liquid feeders for secondary ingredients. This meter operates with pneumatic diaphragms. It is highly accurate over a wide range and simple to install on new or existing conveyor systems.—**Builders-Providence, Inc.**, 51 Godding Street, Providence, R. I.

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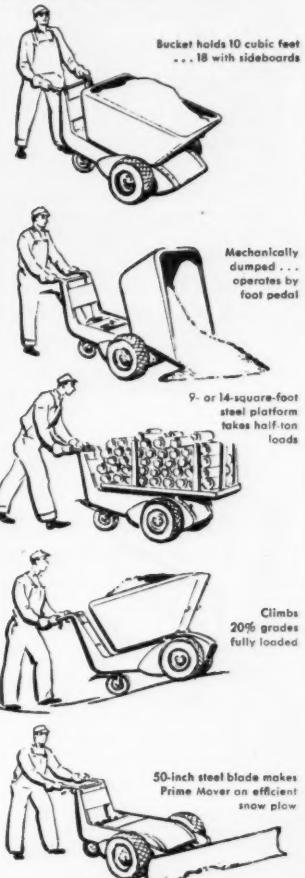
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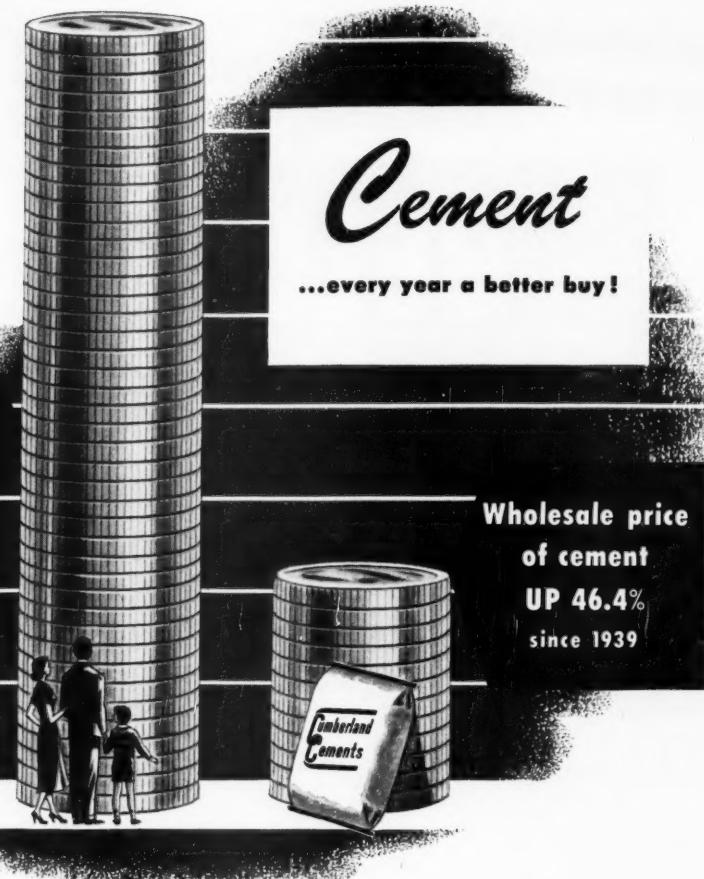
From Seattle, Wash—"We let your distributor demonstrate two machines on a concrete pouring job. Inside of a half an hour we pushed aside our six concrete buggies and finished the job with the two Prime Movers. In 7½ hours we poured 160 yards of concrete with only two men."

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GOGGLE—CLEANING STATION—(4-p. folder) Describes all-metal cabinet for releasing finely atomized Sani-Spray fluid for fog-proofing and cleaning glasses and safety goggles.—**Allen Optical Co., Buffalo 2, N.Y.**

BUILDING PLUMBING DRAINAGE PRODUCTS—(8-p. pamphlet) Describes cloudburst type roof drains, adjustable-level floor drains, grease interceptors, wall closet fittings and carriers for wall-type fixtures. Roof drains are designed for use in prefabricated steel decks, wood, concrete or other types of roof construction. Floor drain makes possible level adjustment without resort to chipping of concrete.—**J. A. Zurn Mfg. Co., Erie, Pa.**

ALUMINUM SHAPES—Detailed drawings of the line of Reynolds standard architectural shapes of extruded aluminum are now available in a portfolio. Looseleaf drawings are on standard 8½x11-in. sheets for easy filing. Cross sections are all printed solid black in actual size, full scale. An index in the front makes it easy for the draftsman to choose the particular shape wanted. That sheet can be placed under the drawing and a tracing can be made directly from it.—**Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.**

GAS UNIT HEATER.—Bulletins describe a versatile and economical gas method of heating for stores, factories, shops and warehouses. Each unit is a complete heat generating and distributing plant, equipped with automatic controls, packaged in a space-saving housing 35x21x23 in., for application near the ceiling to save valuable floor space. Heat generated is transferred directly to the heat exchangers and by them to the circulating air.—**U. S. Air Conditioning Corp., Como Ave., Southeast at 33rd, Minneapolis 13, Minn.**

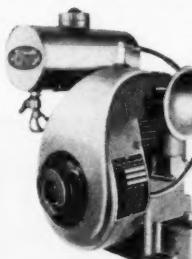
ROAD SWEEPING MAGNETS.—A bulletin tells of a high intensity road sweeping magnet for removing nails, spikes, sharp pieces of steel and other "tramp" iron hazards from roads, airfield landing strips and aprons, parking lots, factory aisles, etc. Magnet is to be mounted on a truck with power supply from a portable engine-generator set.—**Dings Magnetic Separator Co., 4740 W. McGeogh Ave., Milwaukee 14, Wis.**

WOOD DECAY—“Protecting Your Investment in Wood,” is a brochure explaining how and why wood decay occurs, and showing methods of treatment to prevent such loss.—**Chapman Chemical Co., Derman Building, Memphis 3, Tenn.**



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- ✓ Crane Capacity
- ✓ Work To Be Done
- ✓ Clearances
- ✓ Bucket Type and Size

Determine the *closing line pull*; also size of closing and holding cables. The *allowable gross load* is the closing line pull or the safe working gross load . . . whichever is less.

- Consider headroom clearance and any other space limitations • Determine the character of the material to be handled or excavated • Then select the type, size and weight of bucket, and the proper accessories to make the bucket adaptable to your operations.

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It is a standard instrument of precision, of the same exacting construction as our Engineers' Transits.

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VERTICAL CIRCLE: 4" dia, graduated to $\frac{1}{2}$ degrees on solid silver, with double direct vernier reading to one minute, removable aluminum guard to circle.

COMPASS: Gold plated needle about 3 $\frac{1}{4}$ ". Compass ring bezel graduated on solid silver to half degrees, numbered in quadrants. Compass box watertight, with variation ring.

HORIZONTAL LIMB: 5 $\frac{5}{8}$ /16" dia. Graduated on solid silver to $\frac{1}{2}$ degrees, numbered 0°-360° in two ways, with double direct vernier reading to one minute, ivory hinged reflector — two fine spirit levels, sensitiveness about 75 seconds.

CENTERS: Bronze anti-friction alloy, extra long and tilted. Shifting center. Improved clamp and tangent, clamp and leveling screws of nickel silver.

FINISH: Black morocco enamel and lacquer.

EQUIPMENT COMPLETE: Strong aluminum base plate, sun shade, plumb bob, magnifying glass, adjustable pinion screw driver, oil can and brush packed, polished hardwood case. Full length split leg tripod, 3 $\frac{1}{2}$ " 8 thread standard.

WEIGHT: Instrument 10 lbs., tripod 11 $\frac{1}{2}$ lbs.

NOTE: Extension leg tripod extra.



Write for name of
your nearest dealer
or contact us direct.

343 W. Court St.
Milwaukee 3, Wis.

SPRAL CONVEYOR—(48-p. catalog) Covers applications, how to specify, horsepower formulas, etc. All equipment listed conforms to new industrial standard dimensions. Six principal types of spiral conveyor are listed: sectional flight, helicoid, mixer, cut flight, ribbon and cast iron. Selection tables list the various classes of material which can be effectively handled by spiral conveyors and indicate the proper type to use. Capacity tables show the proper size of conveyor to use and the power required. There is

also a page of drawings constituting a guide for laying out a standard conveyor. — **Jeffrey Manufacturing Co., Columbus 16, Ohio.**

HARD BOILED HAT—(4-p. circular) Provides information on Bullard hard-boiled hat's protective qualities against falling objects; also its resistance to moisture and electric shock. Diagrams show how one hat can be made to fit comfortably all head sizes and shapes.—**E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif.**

Dig Deep **FAST!** WITH AN OSGOOD



Get MORE Yardage . . . Even In Tight-Fit, Hard-To-Get-At Corners

Move an agile Osgood hoe right up to the job—and into it—with no lost motion. Its reputation is built on superior speed, mobility, power, and a high and far reach that allows the operator to pick up a load anywhere and to drop it accurately—wherever he wants it.

Yes, whatever the job, you can move more dirt, faster, with an Osgood—Shovel, Dragline, Crane, Clamshell, or Hoe. Gasoline, Diesel or Electric powered— $\frac{3}{4}$ to 2 $\frac{1}{2}$ cu. yds. Write for descriptive literature and specifications.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE OSGOOD CO.

THE GENERAL CO.

MARION, OHIO
DIESEL, GASOLINE OR ELECTRIC POWERED • $\frac{3}{4}$ TO 2 $\frac{1}{2}$ CU. YD. • CRAWLERS & MOBILCRANES

GRAVITY DAMS—Plans and techniques for the building of gravity dams and walls with Atlas steel forms (cantilever design) are described in a 4-p. brochure which contains instructional material including "Typical Details of 'A' Frame Hoists, Showing Use on Upstream, Downstream, and Bulkhead Forms," and "Details of Special Forms at Pier Over Weir and Application of Standard Forms for Crane-Handled Pier Forms." There is also an illustration of typical layouts for training wall forms. The pamphlet points out that Atlas Speed Wall Units may be used for starter forms and other purposes before and after their use in the cantilever assembly.—**Irvington Form Tank Corp., Irvington, N. Y.**

HAND POWER CUTTER—(Leaflet) Redesigned line of hand power cutting tools for bolts, rods, wire, cable, chain, bars and metal of all kinds. Recent improvements include curved toe-in handles which decrease arm spread and wrist bend facilitating an easier and stronger pull. Also broad, rounded palm-fit grip to reduce fatigue. Cutters have no protruding screws or bolts to catch.—**H. K. Porter, Inc., Somerville, Mass.**

CONTOUR SAWING MACHINE—An 8-p. catalog describes Zephyr sawing machines, with photos and specifications on an easy-to-read chart. The machines range from a 425-lb. model with a 16-in. throat to a powerful precision model of 5,640 lb. with a 60-in. throat. Listed are 62 representative materials that may be contour cut with these machines.—**The DoAll Co., Des Plaines, Ill.**

COOLING SYSTEM CLEANER—A 4-p. circular tells of a high pressure steam cleaner for the cooling systems of cars, trucks and tractors. It is claimed that the "Hypersure Jenny with Steam Thoro-Purge" combines the four essentials for complete cleaning of cooling systems—heat, chemical action, strong blast, and clear water rinse—and it works very quickly. —**Homestead Valve Mfg. Co., Coraopolis, Pa.**

PRECAST GYPSUM ROOF DECKS—(12-p. pamphlet). Discusses function, utility and limitations of use of precast structural gypsum roof plank, reinforced on all four edges with galvanized sheet steel formed into tongues and grooves and also reinforced with welded steel mat. Included also are specifications and special instructions for unloading, handling, hoisting, placing, cutting and use of clips and nails.—**United States Gypsum Co., 300 W. Adams St., Chicago 2, Ill.**

ON EVERY CONSTRUCTION JOB

"THE HAT THAT TAKES CARE OF
THEIR HEADS!"

M·S·A



SKULLGARDS keep their title to greatest popularity in industry through *dependable protection*—proved every day—and *lightweight wearing comfort*—proved every minute! Perfect balance, cushioned sweatband and shock-absorbing inner hammock mean dress-hat wearing ease! A variety of hat and cap styles to choose from—standard head sizes.

THE SKULLGARD WINTER LINING

Warm, snug comfort when cold winds blow! Tailored to fit smoothly, of close-weave greyfall cloth—zips into Skullgard, easily removed. Covers head, ears and back of neck.

WRITE FOR BULLETIN DK-15



M·S·A

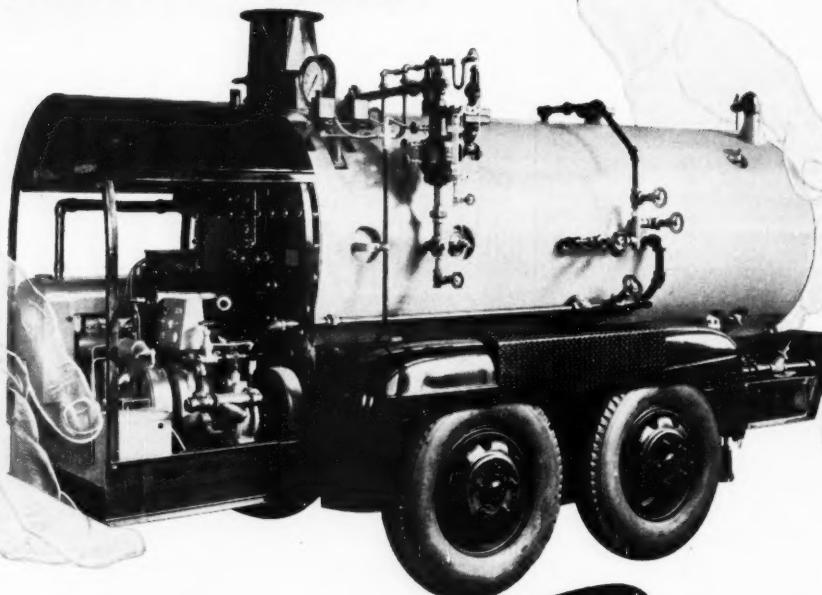


MINE SAFETY APPLIANCES COMPANY

Braddock, Thomas and Meade Streets • Pittsburgh 8, Pa.

At Your Service: 54 BRANCH OFFICES
IN THE UNITED STATES AND CANADA

It's portable . . . It's packaged



PUT IT WHERE YOU NEED

- ★ READY MIX CONCRETE PLANTS ★ BITUMINOUS MIXING PLANTS
- ★ PILE-DRIVING ★ ASPHALT STORAGE TANKS ★ TANK CAR HEATING
- ★ AGGREGATE HEATING ★ WINTER CONCRETE OPERATIONS

COMpletely packaged unit — portable — suitable for a wide range of construction work such as — asphalt plant, storage and tank car heating, aggregate heating, ready or hot mix plants, pile driving, and winter concrete work for both hot water and steam for curing — this Cleaver-Brooks Steam Generator will save time and money on many of your operations.

Available in 80 HP and 125 HP—150 PSI. (For permanent installation a capacity range of 15 to 500 HP is available in other Cleaver-Brooks packaged steam generators.)

Clean, smokeless and require no ash disposal. Provide the easiest fuel handling. Complete safety protection — a four-pass boiler designed in accordance with A. S. M. E. code; inspected and approved by Hartford Steam Boiler Inspection and Insurance Company.

CLEAVER-BROOKS COMPANY
387 E. Keefe Ave., Milwaukee 12, Wis.

Steam

Cleaver-Brooks
PORTABLE • PACKAGED STEAM GENERATORS

80 H.P. — 125 H.P. — 150 P.S.I.

EXPRESSLY DESIGNED FOR CONSTRUCTION OPERATIONS

- Fast Steaming
- 80% Efficiency
- Low Cost Operation
- Light-Weight
- Skid Mounting for Truck or Trailer
- Low Fire Start
- Modulating Control of fuel oil — assures constant steam pressure
- Electric Ignition
- Burn any Fuel Oil up to Commercial standard CS12-48
- Self-Contained Fuel Tanks
- Full Weather Protection
- Factory Finished and Tested
- Choice of Gas or Electric Motor

Send today for illustrated catalog on the Cleaver-Brooks Model LFM Steam Generators.



Built by the Pioneers and Originators of Packaged Steam Generators — Tank Car Heaters — Bituminous Boosters

EQUIPMENT MEN

and Their Companies

Current developments among manufacturers relating to expansion of services, shifts in personnel, and other changes, include the following:

SALES—George O. With, former manager of sales, construction industries for U. S. Steel Supply Co., has become assistant vice-president, and his former place will be taken by Dwight L. Merrel. Clifford W. Lord has been elected vice-president in charge of all Pacific Coast warehouses, including the new ones at Portland, Ore., and Seattle, Wash. . . A separate stainless steel sales division has been established by the American Steel & Wire Co., with B. E. Eudy as manager . . . Wm. S. Hawkins is division sales manager of the Osgood Co. and the General Excavator Co. of Marion, Ohio, for Texas, Oklahoma, Missouri, Iowa and part of Nebraska . . . Perry E. West has been appointed director of sales promotion for Associated Wood Products Co., of California and Oregon, structural timber contractors, which recently has opened a Portland, Ore., branch under Jack D. Godfrey . . . Robert L. Somerville is assistant general sales manager for Exide batteries, Electric Storage Battery Co. . . . J. Roger Hayden has been promoted to assistant industrial sales manager of the Columbus, Ohio, division, International Derrick & Equipment Co.

DISTRIBUTORS—To handle executive sales and service for Madison asphalt plants, Johnson float finishers, travel-mix plants and aggregate handling equipment for **Madison Iron Works** of Huntington Park, Calif., the following have been appointed: Mott Haven Equipment, 211 E. 149th St., New York; Hunter Tractor and Machinery Co., 327 S. 16th St., Milwaukee, Wis.; and the Barrios Co., 227 International Trade Mart, New Orleans, 12, La.

PERSONALITIES — Stephen W. Benedict is director of research of The Master Builders Co., Cleveland, Ohio . . . Wm. Seymour-Jr., has been made vice-president; C. L. Hardy, assistant vice-president; and Thos. G. Miller, secretary of Joseph T. Ryerson & Son, Inc., Chicago steel distributors . . . Roland Vokac is now with Husky Refining Co. of Cody, Wyo., in a consulting and advisory capacity, partly to assist in the development of industrial asphalts . . . A. H. Lundius has been appointed plant manager of the Hyatt Clark Township plant of the Hyatt Bear-

(Continued on page 140)

SPEED
ACCURACY
MOBILITY

3000 LBS.
of
MECHANICAL
DYNAMITE

Parmanco
MECHANICAL FEED
HORIZONTAL DRILL
WITH TRACTION DRIVE

Ten years of field test has proven that our power-feed design of direct, transmission and worm gearing with two-speed control will not only cut shot hole drilling time in half but also eliminates costly maintenance delays. V-belt drive to the power-feed with an additional ample clutch in that assembly gives absolute control of a drilling speed of two to three feet per minute with a retrieving speed of twenty-four feet per minute.

The Parmanco Horizontal is adapted to all forms of high-wall drilling, will handle a six-inch auger up to a distance of sixty feet or more and, by use of our patented augers with interrupted flights and secondary cutters, will drill an absolutely clean hole with a minimum of torque. It permits the drilling of a controlled-angle hole which makes possible a great saving of explosives through the cantilever effect of this controlled-angle drilled hole.

EFFICIENT STRIPPING STARTS WITH
EFFICIENT DRILLING

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS



3 Miles of New Road on U.S. 322



Mapping out the day's operations. Left to right: William Berlanti, contractor; Harold V. Runner, resident engineer, and W. Ralph Eccles, district construction engineer, both of Pa. Dept. of Highways; and Eugene Kohles, carpenter foreman.

In order to provide a better, safer road for the heavy volume of traffic using U.S. 322 between Chester and Concordville, Pa., the Pennsylvania Department of Highways recently called for three miles of relocation in the Concordville area. The new road is virtually free of turns, and its construction included the erection of four bridges and three culverts. Contractor for the project: Berlanti Construction Co., of Harrison, N. Y. The bridge reinforcing, as well as bar mats and dowel units, were supplied by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation*

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Guard Rail Posts
Bar Mats • Guard Rail • Wire Rope and Strand
Hollow Drill Steel • Spikes • Bolts and Nuts • Pipe
Sheet- and H-Piling • Fabricated Structural Steel
Timber Bridge Hardware • Tie-Rods



Trucks are loaded fast in this well-equipped batching plant adjacent to new road. Note stockpile of Bethlehem Bar Mats at left.

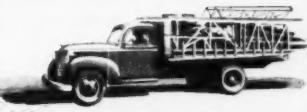


Form setters and fine-grading crew have a job on their hands keeping ahead of the fast-moving paver shown near brow of hill.



One of four bridges in the making. With Bethlehem Reinforcing Bars in place and securely tied, pouring of deck gets under way.

Four hours ago this complete elevator was on a truck



They hauled it to the job only this morning . . . and before noon it was set up and running! And notice . . . this AMERICAN Material Elevator is all there. There's nothing else to add. As upper floors are added, elevator height is already available to serve them. The setup job is done . . . for good.

Now, compare this fast easy job with the costly, labor-wasting, time-consuming task of cutting, fitting and erecting timbers for an ordinary wooden tower. Think of the hours your workmen will spend keeping it in safe operating shape. Try to figure how much it will cost you to tear it down when the job's finished. Try to estimate the cost of the lumber you're bound to waste . . . and remember, with a wooden tower, you'll be repeating this expensive process on every job! You can eliminate all those profit-whittling costs with an AMERICAN Material Elevator. Doesn't that make sense?

And you don't even have to buy one. Most AMERICAN HOIST construction equipment distributors have AMERICAN Material Elevators you can rent at low cost for as long as you need them. Though, after you've tried one on a job, you'll likely want to own your own.

PUTS ITSELF UP

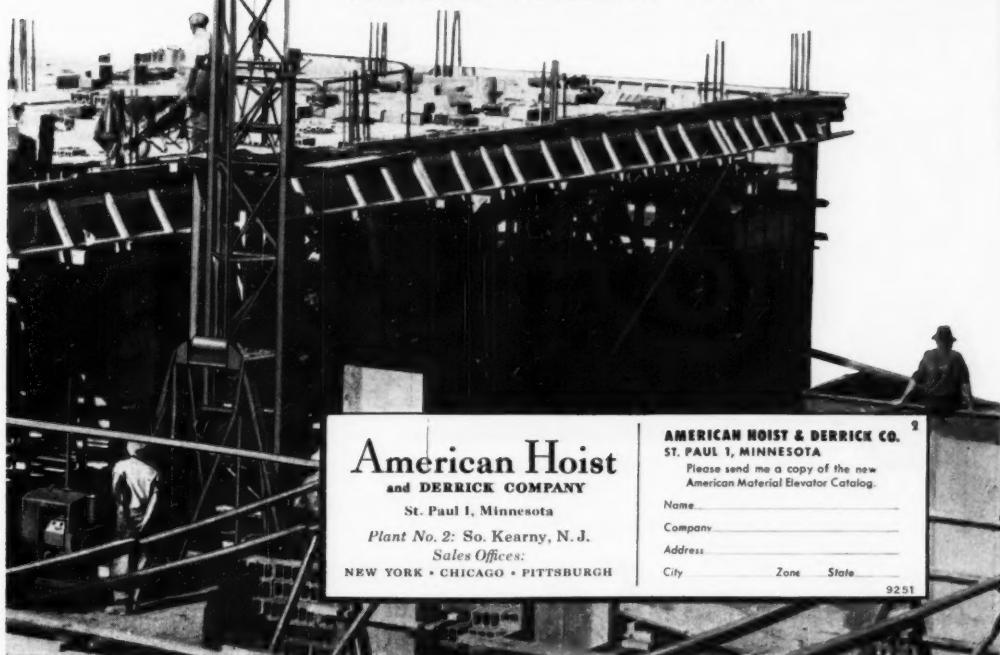
• Elevator's own hoist lifts 47 foot tower into position. Additional tower sections of 10 feet each are easily placed with a gin pole to a height of 97 feet.

INTERCHANGEABLE CONCRETE BUCKET

• Big 6 x 6 foot platform is quickly interchangeable with a half-yard self-dumping concrete bucket.

EXTRA LOAD CAPACITY

• A 2500 pound load glides up the AMERICAN Material Elevator at 87 feet a minute. Bigger loads at greater speed mean savings in time and costs.



American Hoist and DERRICK COMPANY

St. Paul 1, Minnesota

Plant No. 2: So. Kearny, N.J.

Sales Offices:

NEW YORK • CHICAGO • PITTSBURGH

AMERICAN HOIST & DERRICK CO. ST. PAUL 1, MINNESOTA

Please send me a copy of the new
American Material Elevator Catalog.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

9251

RUD-O-MATIC TAGLINE

Provides positive, steady tension — holds buckets steady under all working conditions.



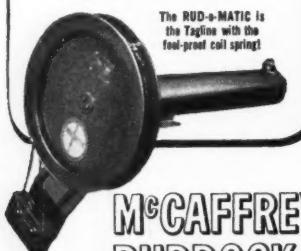
Spring tension holds buckets steady. No weights, pins, tracks, or carriages. Cable saving more than pays for RUD-O-MATIC. Compact—easily installed. Eight models to fit all bucket sizes.

RUD-O-MATIC Taglines are used as standard equipment by most crane manufacturers. Spring tension is powerful enough to hold a clam shell bucket steady. Operates with boom at any angle. Compact—it can be installed in less than thirty minutes. No pins, weights, tracks, or carriages to wear or be replaced. Taglines are complete with fairlead U bolt clamping plates, and cable attached. Immediate delivery—see your equipment dealer—or write—

- Dealers—selected territories in Midwest and Northwest are still open. Write for all details.

RUD-O-MATIC combination Magnet Reel and Tagline . . . operates on spring tension principle with tagline attached to magnet to steady—and electric cable fastened to magnet connections with all slack needed to prevent cable from being pulled or jerked loose from connections. Exclusive with RUD-O-MATIC.

The RUD-O-MATIC is the Tagline with the fool-proof coil spring!



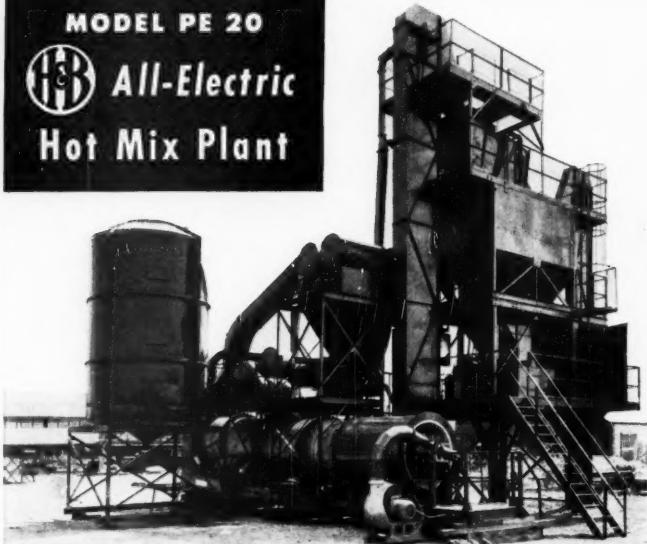
**McCAFFREY
RUDDOCK
Tagline**
Corporation

2131 East 25th St., Los Angeles 11, Calif.

(Continued from page 137)

ings division of General Motors Corp. near Harrison, N. J. . . C. S. Gotwals is quality manager of all SKF Industries . . . Maynard B. Terry is vice-president of the American Brakelok division of the American Brake Shoe Co. . . . Thos. F. O'Neil of Boston, Mass., and Dan A. Kimball, Pasadena, Calif., have been appointed directors of The General Tire & Rubber Co. . . . R. E. Whinrey is assistant general manager of the Link-Belt Dodge plant in Indianapolis, Ind., and L. C. Heinlein, superintendent . . . Emil Schaeffer is chief engineer of the Tower division of the Elizabeth Iron Works, Inc., Elizabeth, N. J. . . Robert M. Arnold, a director of Allegheny Ludlum Steel Corp. has been appointed a vice-president. He is also president of Arnold Engineering Co., Chicago, a wholly owned subsidiary . . . Frank O. Lincoln has been elected chairman of the board of the Hy-Pro Tool Co., New Bedford, Mass. . . . Three additional assistant divisional parts manager have been appointed by General Parts Manager M. T. Deames of Caterpillar Tractor Co., Peoria, Ill. They are T. A. Dunne in the Eastern Division, J. E. Ferguson in the Central Division and W. R. Owens in the Western division.

MODEL PE 20
H&B All-Electric
Hot Mix Plant



**A Sectional Type Plant . . .
With Stationary Plant Efficiency**



THE MOTO-PAVER

A self-contained, self-propelled machine which accomplishes the complete mixing and laying job in one continuous operation, using over 100 different materials, including all types of emulsions, asphalts and tars. Particularly adapted for resurfacing jobs on county roads and city streets.

Although the Hetherington & Berner Model PE is a sectional type plant and can therefore be moved, it retains all the features of a stationary plant that make for dependable and efficient production.

PE plants are electrically driven. All motors and controls are furnished and installed, and the plants are completely wired at the factory before shipment. Optional with this type of plant is equipment for steam dispersion, fugitive dust collection, low pressure oil burning and dust handling. Write for Bulletin P-46 which gives specifications and complete information.

HETHERINGTON & BERNER INC.
735 Kentucky Ave., Indianapolis 7, Ind.

H&B Builds Portable and Stationary Asphalt Plants of All Types, Sizes and Capacities

Mr. Dunne will serve with Eastern Division Manager B. J. Grimm and assistant J. F. Heschong; Mr. Ferguson with Central Division Manager Thomas H. Hodgin and assistant C. F. Cummings; and Mr. Owens with Western Division Manager Herman F. Haven and assistant W. E. Doersam . . . Bernard H. McGuiness, for three years works manager of the Passaic, N. J., plant of **Hewitt-Robins Inc.**, materials-handling machinery manufacturers, has been appointed vice-president of the company's Robins Conveyors division . . . **J. G. West** has been named vice-president and manager of the Indiana Division of the **Lone Star Cement Corp.**, with headquarters in Indianapolis, succeeding **George E. Pierson** . . . **John C. Keplinger** has been promoted from vice-president in charge of sales of **Hercules Motors Corp.**, Canton, Ohio, to executive vice-president . . . **Jay E. Jellick**, has been appointed manager of the San Francisco headquarters of the **Portland Cement Information Bureau**, succeeding the late Ralph Rader. Returning to his old post after spending the last five years as sales manager of Pacific Portland Cement Co., Jellick previously served as district engineer and manager of the Pacific Coast offices of the Portland Cement Association . . . **Kennametal, Inc.**, Latrobe, Pa., manufacturers of cemented carbide tools, announces appointment of **Robert Hutchinson** as an application engineer in the central district, headquarters in the Cleveland office at 860 Hanna Bldg. . . . **Gar Wood Industries, Inc.**, announces the appointment of **W. F. Keeton** as manager of its Los Angeles Branch . . . **Paul Bremer** and **Wendell R. Holt** have been appointed assistant vice-presidents of **Durisol, Inc.**, manufacturers of building materials . . . Election of **George J. Neumann** of Allentown, Pa., as a vice-president and of **Leo I. Bruce** of New York as secretary has been announced by **Lehigh Structural Steel Co.**

MISCELLANY—Steel capacity at **American Steel & Wire Co.'s** Duluth, Minn. works, will be increased 35 percent a year . . . A voluntary retirement income plan to which members of the **Kohler Co.** organization with five years of continuous service are eligible has gone into effect at Kohler, Wis. This company recently celebrated its 75th anniversary and had a Christmas party for 550 members of its "quarter century club" . . . Announcement of the change of company name to **Wright Manufacturing Co.**, and the appointment of **Bertram R. Scheff** as its general sales manager, has been made by **Thomas F. Millane**, president of Taylor Manufacturing Co., Milwaukee, Wis. . . . In December

(Continued on page 143)

PROVED PERFORMERS— ON THE TRENCHING JOBS



CLEVELANDS

CAN BE ABSOLUTELY DEPENDED ON FOR

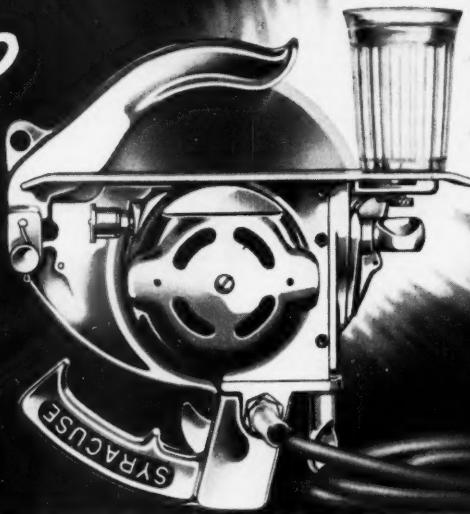
- FAST ACCURATE DIGGING
- MINIMUM "DOWN TIME"
- PROMPT PARTS SERVICE
- LOW OPERATING COST

...whether the work's for water, sewer, power, gas, telephone, oil or gasoline lines, for drainage, irrigation or building foundations. Fast, mobile, rugged, easy operating, amply powered, compact and with all excess weight eliminated—CLEVELANDS enable you to meet easily the many varying conditions of country, town or city work. For the CLEVELAND model best fitted for your work, call your nearest CLEVELAND distributor, or write direct.



THE CLEVELAND TRENCHER CO.
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

**THE
BALANCED
SAW...**



PORTER-CABLE
Speedmatic

BALANCED for easier handling!
BALANCED for truer sawing!
BALANCED for variety of cuts!

Here's the Speedmatic Saw that out-classes any portable electric saw on the market today! It feels balanced when you lift it! It's balanced when you hold it! It's balanced when you run it! No other saw compares with it!

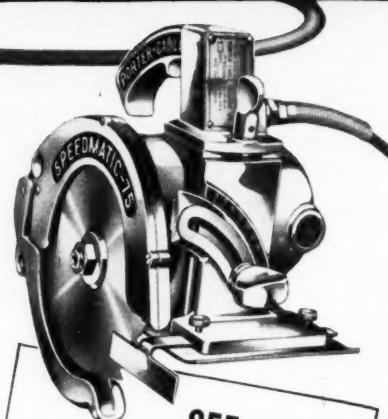
TRY THIS SIMPLE TEST

Balance the Speedmatic upside down on its handle (no other saw will do this). Place a full glass of water on the extra-broad shoe. Start the motor. The blade speeds up to 7,000 RPM. But—not a drop of water spills. It's balanced! The weight is balanced . . . the moving parts are balanced. There's no torque twist or jerk. The helical-gear drive runs easily and smoothly . . . delivers 11% more power to the blade.

And the entire saw is so compact, so expertly designed and precisely built, that it's lighter in weight . . . easier to use with one hand . . . for less tiring in a day's work.

MODELS: K-75 (2½" cut); K-88C (2¾" cut); BK-10 (3¾" cut); BK-12 (4¾" cut).

PORTER-CABLE Machine Co., 1742 N. Salina St., Syracuse, N.Y.
Manufacturers of Speedmatic and Guild Tools



SEE the Speedmatic
at leading hardware, mill supply and lumber dealers. Feel it. Try it. You'll agree no other saw compares with it! Literature and name of nearest dealer on request.

Another Speedmatic Feature—Big micrometer screw quickly raises or lowers blade. One turn equals ¼". Depth of cut regulated to close accuracy.



PORTER-CABLE
Speedmatic
the Line of Balanced Design

(Continued from page 141)

42 factory representatives from the U. S. and Canada visited the headquarters of the **Barnes Mfg. Co.** at Mansfield, Ohio . . . **Raybestos-Manhattan, Inc.**, has a new Seattle, Wash., warehouse and office at 314 Occidental Ave. . . . A branch office at 202 Plymouth Bldg., 2036 E. 22d St., Cleveland, Ohio, has been opened by **Kinney Mfg. Co.**, Boston, Mass., liquid pumps, vacuum pumps, clutches and bituminous distributors.

Contractor's Job Office Procedure . . . Part I

(Continued from page 42)

pany decalcomanias, and the larger pieces should have the company name painted on them prominently.

Loading for Shipment—Needless expense can be avoided by proper loading of equipment and used materials when moving to or from a job. Freight regulations are far too complicated to be covered in this manual, but we will give you a few general principles.

Consult your local freight agent as to rates, blocking, classifications, routing, car sizes and weights, and all other questions. If the movement is large, hire a traffic expert. In general, watch the following points.

(a) **ORDERING CARS.** Order short cars where possible, especially for a crane boom. If they have to give you a longer one, they must give you the short car rate. Specify good sound cars for long hauls. Get cars that will permit you to load just over the minimum, and still divide up your load the way you plan. If you load under the minimum, you pay a bonus for the car. If you overload, the car is more likely to be condemned along the line.

(b) **LOADING BY CLASSIFICATION.** A mixed car takes the highest rate of any of its items. So get your high-rate items together, and your low-rate items loaded separately. The most frequently used classifications are "Contractor's Equipment" (which is high rated), second-hand machinery, and used lumber.

(Continued on page 144)

Users Find that

COFFING *Safety-Pull* HOISTS

—**MULTIPLY MANPOWER** Extremely easy to operate, they help workmen do more work, faster, easier. Ruggedly built to handle wider range of jobs.

—**COST LESS TO USE** Moderately priced, Coffing Ratchet-Lever Hoists have many parts of drop-forged, heat-treated alloy steel, other long-life features to hold down replacement and maintenance costs.

—**HELP RAISE SAFETY STANDARDS** Coffing safety features include dual ratchet and pawl assembly that cannot slip or drop load; "Safety-Load" handle to avoid dangerous overloading.

WRITE FOR BULLETIN DSP-4, giving full information on nine models of the Safety-Pull hoist— $\frac{3}{4}$ to 15 tons capacity. See how they can help your workmen do more jobs—faster, easier, safer.



AMAZING HOIST-JACK
IS A HOIST—
A JACK—A PULLER

—**3 useful tools in 1.**
Built in two sizes,
2000 lb. and 4000 lb. to
handle scores of jobs.
Send for Bulletin DHJ.



COFFING HOIST COMPANY • Danville, Ill.

ELECTRIC, SPUR-GEARED AND DIFFERENTIAL CHAIN HOISTS;
"MIGHTY/MIDGET" PULLERS; LOAD BINDERS



*Of Course
it's an*

OMAHA DRAGLINE BUCKET



Year after year OMAHA Dragline Buckets have proven themselves moneymakers and time savers. Every extra pound of weight has been removed to mean extra profits in every load.

Omaha Dragline Buckets, the original lightweight buckets, have been earning this extra profit for many contractors through many years.

Write for a free catalog.

DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.



THE NEW HERMAN NELSON Economy Model Portable Heater

- Provides Quick, Clean, Safe Heat—without smoke, soot, fumes or open flame!
- Abundant fresh, heated air — forced to areas where most needed!

Burns range oil, kerosene or prime white distillate—costs but 19c per hour!

125,000 BTU per hour capacity—enough to heat almost two ordinary 5-room houses!

Electric motor powered; 115-230 volt, 60 cycle, single phase.

One 12" dia. x 12' long, extendable hot air duct.

Small, compact, light weight.

LOW PRICED FOR THE SMALLER JOBS!

Write for Interesting Free Booklet on "Cost Control"



**THE HERMAN NELSON
CORPORATION**

MOLINE
ILLINOIS

SINCE 1906 MANUFACTURERS OF QUALITY HEATING AND VENTILATING PRODUCTS



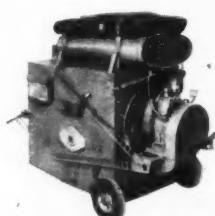
"He's been putting on the dog, ever since he won with that sweepstakes ticket."

(Continued from page 143)

(c) **BLOCKING.** Loads must be absolutely secured, both for our own protection, and to prevent a "bad order" condemnation en route.

(d) **ROUTING AND EXPEDITING.** Work out the fastest and most convenient routing ahead of time. Advise agents at transfer points of need, if special handling must be given them. Trace from both ends, so you never lose track of a shipment. If in a special hurry, send an alert man along. Small tips and personal visits to division point yardmasters, and especial attention at transfer yards, will get results.

Still Available



The original Herman Nelson, gasoline burning, gasoline engine powered, Portable Heaters. For areas lacking electric power. Completely self-powered. Easily portable by one man.

Insurance—Our company policy is to carry insurance whenever a catastrophe is possible. This means covering all possibilities of personal or property damage where a large claim could result. Water work should be examined with particular care as to possible disasters from flood, scour, drought, diversion, etc.

Certain types of insurance are essential on all jobs. We carry blanket policies by geographical divisions on Workmen's Compensation, Public Liability and Property Damage, and Contractual Liability. Auto and Truck Insurance, Forgery Coverage, Equipment Floater and the Fidelity Bond are other coverages under blanket policies through the home office. The area office should check

each contract to determine the requirements on the following: Performance Bond, Payment Bond, Assumed Liability and the Finished Product Bond. Needs for Builder's Risk, Legal Liability, Cofferdam Risk, etc., are determined by analyzing job operations. The home office should be informed promptly of any events that change the rates or limits on the above types of insurance.

Setting Up the Job Office—The job office is for the use of the job superintendent, engineers, and the office personnel. Sometimes a job-site office is not possible, and a nearby building, a hotel room, or a local office building will be used. Notify the area office and home office of the post office address and phone number as soon as they are known. Display a good-sized sign, lettered to let the public know the company name, use the company decalcomania thereon also, and use these decals freely in general.

The area office manager will name the job office manager and assist him in hiring clerks, in obtaining office equipment, stationery, supplies and forms (see addendum II for lists and sources), and getting routine procedures started right.

Keep the job office neat and clean. If space is provided for subcontractors, they should be required to follow the office regulations concerning neatness, hours, noise, etc.

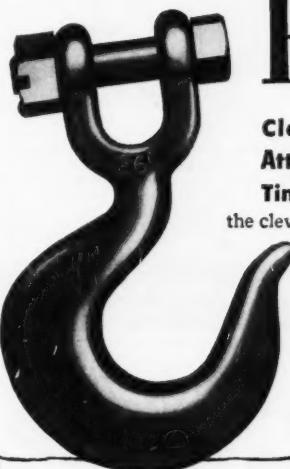
Establish a careful handling system for both incoming and outgoing mail. Get a date rubber stamp with "Received" on it, and the initials of persons to whom correspondence is referred. Stamp all letters as received, and route to the persons concerned. As the mail is opened, the coding rubber stamp is placed on each invoice to show the date received.

"New Job" Organization Report—Our form is self explanatory. It should be sent to the home office and the area office just as soon as the information is ready.

Payroll Banking—A bank for payroll purposes is selected by the project manager or home office, and need not be a local bank. The fewer bank accounts we have the less money is kept tied up to maintain minimum balances. Where local pressure is felt, or where it is difficult for employees to cash checks drawn on a strange bank,

(Continued on page 146)

Here are Hooks that hoist your Profits!



Clevis Hoist Hook Is Quickly Attached... Changed... Saves Time and Labor.

Slip the bolt through the clevis, spin the nut, spread the cotter and this heat-treated hook's ready and safe for your toughest jobs. No welding, no spelter, no connecting fittings required. Send for Laughlin's famous data book of industrial fittings... Catalog No. 140.

THE THOMAS LAUGHLIN CO.,
DEPT. 1, PORTLAND 6, MAINE.



Laughlin Safety Hook . . . "The Latch Locks The Load" . . . adds a big safety factor to every lift. Sturdy latch, stainless steel spring. For every industrial application.



Laughlin Replacement Swivel Hook Assembly with Safety Latch. Bolts on and off . . . no machining . . . no threading. For hoists, cranes, lashing operations. One-ton and half-ton sizes.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS





Rugged strength, safety, versatility — get all three with Simplex Hydraulic Jacks. Get the "low cost of lifting" plus jacking power that makes construction work go faster and easier.

Whatever your need, there's a Simplex Hydraulic Jack to do the job with efficiency that means hours and dollars saved. There's extra safety, too, with Simplex — every model is tested to 50% over rated capacity.

Other features that insure easier, faster, more dependable operation include

Neoprene packing seals, pressure tested bases, a long pump stroke that requires less effort, operation either horizontally or vertically. Available in 8 models — 3 to 100 ton capacities.

Simplex
LEVER • SCREW • HYDRAULIC
Jacks

SEND FOR NEW HYDRAULIC JACK BULLETIN TODAY!

TEMPLETON, KENLY & COMPANY
1008 South Central Avenue • Chicago 44, Illinois



New!

STOPS MOISTURE FROM FALLING
INTO TRACTOR EXHAUST

No.	O.D. Exhaust	Retail
1	2 $\frac{1}{8}$ "	\$1.90
2	2 $\frac{3}{8}$ "	1.90
3	2 $\frac{3}{8}$ "	1.90
5	2 $\frac{1}{8}$ "	1.90
55	2 $\frac{1}{8}$ "	1.90
5x	1 $\frac{3}{4}$ "	1.90
6	1 $\frac{1}{2}$ "	1.90
66	1 $\frac{3}{8}$ "	1.90
7	2 $\frac{1}{2}$ "	1.90
8	3 $\frac{1}{2}$ "	2.50
9	3 $\frac{1}{8}$ "	2.50
10	3 $\frac{1}{4}$ "	2.50
11	3 $\frac{1}{2}$ "	2.75
115	3 $\frac{1}{4}$ "	3.00
12	4 $\frac{1}{2}$ "	3.00
123	4 $\frac{1}{8}$ "	3.00
125	4 $\frac{1}{4}$ "	3.00
14	4 $\frac{1}{2}$ "	3.00

Write Dept. CM.

THE CAP THAT DOES NOT FORGET TO CLOSE
Completely automatic — the "RAINCAP" is counterbalanced to open when the tractor starts and close when it stops. Rust proof—made of cast aluminum—with bronze bushings—can be installed in two minutes. F.O.B. Waterloo, Iowa.

- Immediate delivery
- Liberal Dealer Discount



WATERLOO FOUNDRY CO., WATERLOO, IOWA

(Continued from page 145)

a local account should be opened. When a bank is selected, inform the home office and obtain their approval.

Payroll checks are usually signed by the job superintendent or project manager, but on some jobs by the office manager or payroll clerk. A bank signature card should also be signed by proper home office officials. Banks are requested to mail statements direct to the home office, semi-monthly, together with cancelled checks.

Petty Cash Imprest Fund—Each job office is supplied by the home office with a petty cash fund to handle small expenditures. Full responsibility for handling and accounting for this fund is assigned to one person, usually the office manager. The fund should be kept in a locked file, and the key held by the responsible person only.

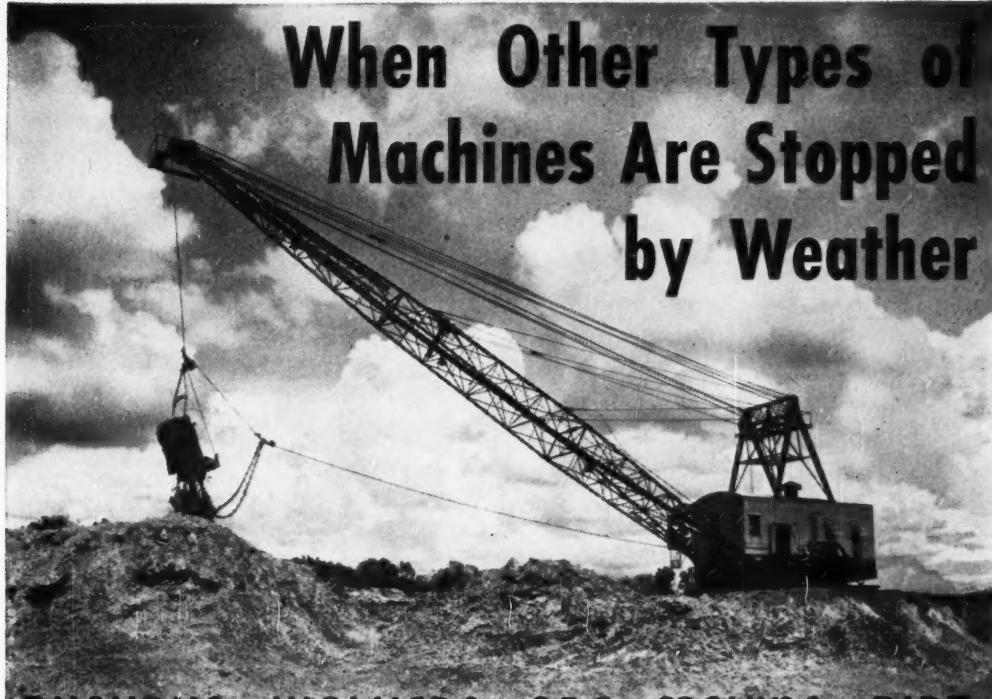
Credit and Discounts—Vendors or banks to whom we are unknown, are referred to Dun & Bradstreet. Our system of paying accounts from the home office should be carefully explained. In brief, all invoices must be checked and approved by the job office; processed invoices are mailed daily to Minneapolis, and paid there in accordance with the vendor's terms. Unless a discount, some special pre-payment custom (as for equipment rental), or vendor's hardship require earlier payment, all bills are paid on the 10th of the following month. Each new vendor should be asked for a specific statement of his discount terms. Always watch special discounts and discounts that differ on various items. (See "Discounts" under Section 4.)

Freight Bills and Sight Drafts—The job office informs local freight agents of railroads and truck lines that bills for collect freight are to be presented to the job office for approval, but payments of such bills will be made from the home office. Sight draft arrangements will be made if the freight agent wishes. A sight draft is a check drawn on us by the freight agent, in keeping with a previous agreement. It is validated by attaching an approved freight bill.

Demurrage — Freight offices should be requested to notify the job office at once when cars arrive, so they can be unloaded immedi-

(Continued on page 149)

When Other Types of Machines Are Stopped by Weather



BUCYRUS WALKERS ARE MOVING DIRT

Let it rain, let footing get soft and muddy, and that's the automatic "quit" signal for most excavators. But with Bucyrus-Erie walking draglines, work goes on as usual under those—and worse—conditions. Their unique stability while digging or moving lets them continue to deliver the big output for which they're famous in the face of such conditions.

For walking, the exclusive rolling cam always produces smooth action, cushioning the machine down, while the large shoes and circular base provide plenty of bearing area to insure safe, sure progress in spite of soft footing. During digging, the machine's center of gravity is always kept within predetermined limits so that rim pressures stay safely low and there's little coning of the ground under the machine. Because the operator knows he can count on Bucyrus-Erie "sure-footedness," he can use all the machine's "years ahead" speed and capacity even when bad weather has halted other units.

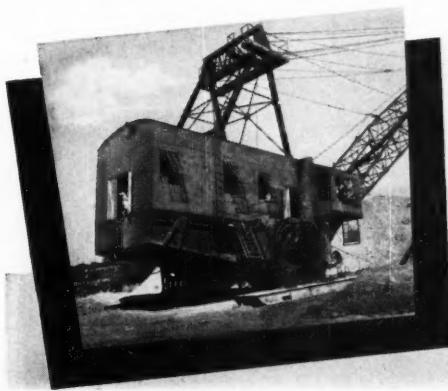
BOOMS: 110 to 250 ft.

BUCKETS: 4 cu. yd. to 25 cu. yd.

**BUCYRUS
ERIE**

SOUTH MILWAUKEE, WISCONSIN

22M47





Note this difference

The illustration shows you how each wire and each strand in

Preformed Wire Rope

is preshaped to the position it assumes in the finished rope. As a result, Preformed lasts longer, handles easier, is safer to use, and saves installation time.

Take advantage of the savings Preformed wire rope offers. Ask your supplier about it. Then specify Preformed wire rope on your next order.

(Continued from page 146)

ately. This keeps demurrage charges at a minimum. Standard average demurrage agreements should be arranged with the local freight agents. In this way, credit for fast unloading applies against occasions when more than the allotted time is used.

Freight Damage Claims—Responsibility for claims for damaged or lost items should be thoroughly understood between the job office and the shipper. If we have a claim against the carrier on goods shipped f.o.b. factory, we must pay the vendor's invoice and then look to the carrier for repayment.

Accident Report Blanks—The insurance companies supply forms for the following coverages, and will advise the number of copies required and where to send them: Workmen's Compensation, Public Liability, Property Damage, Auto and Truck Accident, Builder's Risk, and Equipment Floater. Forms for reports under special coverages other than the above, may also be obtained from the insurance carrier.

Code of Job Cost Accounts—Our code of job cost accounts gives a standardized cost distribution of payrolls and invoices. The code is designed to meet the requirements of every type of job which we might operate. Being flexible, additional numbers and items may be added as needed. It is important that each job office become thoroughly familiar with the code, since it is used constantly. Whenever doubtful of the correct code number to apply to a particular item of material or labor, consult the job superintendent or write the home office. (See addendum for explanations of items covered by various accounts.)

Preparing Job Labor Cost Budget—A Budget of Job Labor Costs is prepared from the bid estimate for the purpose of making weekly comparison to actual job labor costs, compiled on our form designed for this purpose. The accounts to which labor will be charged are selected from the Code of Job Cost Accounts. This becomes the Budget, and also becomes the pattern for the Weekly Labor Distribution Report.

The accounts selected for the Budget should parallel the bid estimate. The weekly comparison

(Continued on page 150)

MADESCO BLOCKS

stand the gaff

Check your tackle blocks NOW!

It pays to service your tackle blocks in the off-season—check the sheaves, pins, bushings, lubrication, etc. MADESCO Auto-Lub (Automatic Lubrication) blocks require no further care. MADESCO blocks are available in a complete line—many are ideal for construction work.

We shall be glad to work with you if you have a special problem.

Send for
complete
catalog . . .

A quarter
century
of service



wire rope
blocks

MADESCO
TACKLE BLOCK COMPANY
EASTON, PENNSYLVANIA

5 BASIC TYPES OF



WRITE
FOR THE
CATALOG
TODAY

Choose the one that most nearly meets your needs and ideas. We'll develop a trailer "tailored" to conform to your ideas, adapted particularly to your tractor and efficiently designed to your specific kind of hauling.

ROGERS BROTHERS CORPORATION
220 Orchard Street
ROGERS
HEAVY DUTY
Trailers
EXPERIENCE builds 'em
PERFORMANCE sells 'em



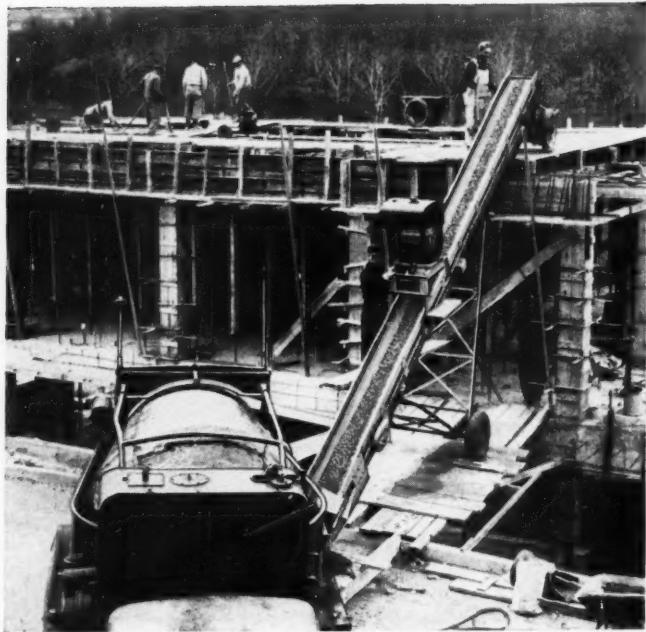
**ARMSTRONG
BROS. CHAIN TONGS**

"ARMSTRONG Bros." Chain Tongs come in "Standard," "Reversible Jaw," and "Ideal" (V-Jaw) types in sizes for every need. Their drop-forged jaws have milled teeth, are hardened, tempered and heat treated for lasting qualities. They have heavy forged-in lugs that give extra bearing surfaces to which they are rigidly held by a large hardened steel rivet. The jaws are forged and heat treated to the correct balance of stiffness and spring. Shafts are drop forged and chains proof-tested to 2/3 catalog strength (3,000 lbs. to 40,000 lbs.).

Write for NEW 5-48 Catalog just released.

ARMSTRONG BROS. TOOL CO.
5234 W. Armstrong Ave., Chicago 30, U.S.A.
Eastern Whse. and Sales: 199 Lafayette St., New York 12, N. Y.
Pacific Whse. and Sales Office:
1275 Mission St., San Francisco 3, Calif.





Farquhar Trough Conveyors Cut Overhead, Increase Profits on ALL Construction Jobs

FARQUHAR Trough Conveyors cut overhead by *releasing manpower* from materials handling jobs to do more *actual construction work!* Contractors save *time, money, labor* with Farquhar Conveyors because (as the illustration shows) they can move wet concrete directly from mixer to work area without concrete loss due to repeated handling. Farquhar Trough Conveyors help you get jobs completed without delay, help eliminate profit losses due to failure to meet penalty dates!

For All Handling Jobs

General-utility Farquhar Trough Con-

veyors handle sharp or abrasive materials, fine or powdery materials, small bags or bundles *faster, better, cheaper* than old-fashioned handling methods. Farquhar Conveyors assure speedier handling, stop waste of time, manpower, and give you greater flexibility for *all operations!* Contractors, chemical plants, coal yards, warehouses—all industries turn to Farquhar for the right answers to specific handling problems. Farquhar offers a complete line of conveyors for portable, semi-permanent or permanent use, handling all kinds of loose or packaged materials. Tell us your problem—we have the know-how to help you.

**Write: A. B. FARQUHAR COMPANY,
Conveyor Division, 222 Duke St., York, Pa., or
622-A W. Elm St., Chicago 10, Ill.**



MOVING DIRT from basement excavation direct to dump truck with gas engine-driven Farquhar 334-T Conveyor saves time for contractor . . . hard, back-breaking work for men.

Farquhar
PORTABLE OR PERMANENT
MATERIALS HANDLING
CONVEYORS

HYDRAULIC PRESSES • FARM EQUIPMENT • FOOD PROCESSING AND SPECIAL MACHINERY

(Continued from page 149)

to actual job costs will be used for active job management by the project manager or superintendent, and for general information to watch for a faltering job by the area office and home office. The historical, actual costs will aid future estimating.

Section 3 . . . LABOR

Hiring Procedure—First, hiring slips must be filled out completely and carefully. Be sure to get the employee's correct full first name and at least a middle initial. This is important to the home office in posting annual earnings where duplicate names must be absolutely identified. The social security number should be verified against the employee's card to avoid mistakes. If the employee has no social security number, have him fill out an application for one. Whenever possible, the employee's correct address should be kept up to date so that annual statement of earnings, etc., will reach him. Knowing the next of kin is important in case of an accident.

Withholding exemption certificates must be filled out by all new employees. Make sure the social security number on this form agrees with the number on the hiring slip.

Important! As soon as a new employee is hired, send the original hiring slip and withholding exemption certificate to the home office. The home office prepares quarterly and annual reports on the earnings of each employee, and these two forms, with the social security number, are essential for such reports. Remember—you have the authority to hold up a man's first check until he furnishes these government requirements.

The duplicate hiring slip gives the payroll clerk the name, classification and rate for setting up the payroll.

Labor Relations — Our hiring slip contains no questions that will conflict with any local or national legal restrictions, to our knowledge, and can be used with confidence by the job offices. Until the Taft - Hartley Act is changed, whenever job offices notify a union they need men, they should also send their requirements to

(Continued on page 155)

HOW TO INCREASE YOUR
DRAGLINE PRODUCTION

10 to 50%

...use a
PAGE AUTOMATIC

YOU'LL get more payload per pass and more passes per hour . . . step up production 10 to 50% . . . when you use a Page Automatic and use it correctly. Quick loading and immediate hoisting are the keys to big yardage. The closer the cycle of operation approaches that of a grab-bucket, the better the yardage will be. Page Automatics land in digging position, dig right in at the first pull on the loadline and get full payload within 1 to 2 bucket lengths, regardless of depth . . . 20 ft. to 100 ft. or more. With most of your operations under or near the boom end, minimum hoisting power is required.

The Page Automatic is the bucket that takes most of the "drag" out of your dragline . . . full loads in shorter distances save bucket and cable wear, reduce maintenance, minimize oper-

ator fatigue. Page Automatics are available in any size from $\frac{3}{8}$ yd. to 30 yd. Each Automatic is guaranteed to out-dig any other dragline bucket of comparable size. For detailed information, see your construction equipment distributor, or write for Bulletin 1519.

PAGE ENGINEERING COMPANY
Clearing Post Office, Chicago 38, Illinois





THIS JOB ON A BUSY STREET CALLED FOR THE PUMP THAT STAYS BUSY!

North Fourth Street in Milwaukee, Wisconsin, is a busy thoroughfare, especially the block between West Michigan Street and Wisconsin Avenue. To lay a new, larger sanitary sewer on this heart-of-the-city job, contractor Otto P. Seefeld had to have equipment that would keep busy without fail.

In the illustration, two Marlow Self-Priming Centrifugal Pumps (a 4-inch 40M and a 30-inch 20M) are shown bypassing sewage as the construction of the new line progresses. In this service these pumps were called on to pump continuously. Large business buildings in the area and a Y.M.C.A. building across the street were depending on them.

The contractor depended on these Marlows, too. There was no room here for a pump that couldn't

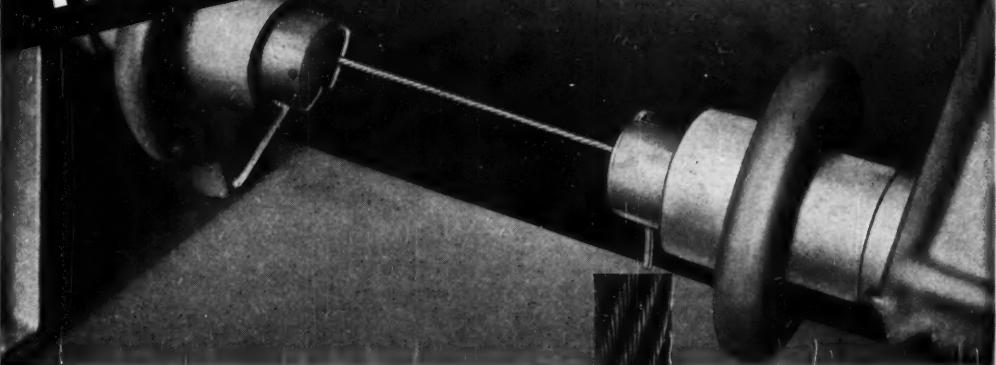
stay on the job without attention.

A Marlow Water Wizard stays busy. It doesn't quit pumping and need to be reprimed. It doesn't need adjustment or manipulation and there are no parts to jam or cause trouble. It doesn't hold up work to be cleaned. You can't beat a dependable Marlow Water Wizard.

Your files should contain the catalog on the World's largest line of construction pumps. Ask your nearest Marlow distributor or write factory.

**MARLOW PUMPS
RIDGEWOOD, NEW JERSEY**

Twisting Tells the Tale of Toughness



Here we see an 8" piece of rope wire being twisted on its own axis. The revolutions necessary to break the wire are counted and only those coils are accepted which test at least 10% above American Petroleum Institute specifications for wire rope. In addition to being an indication for toughness, the torsion test reveals whether the wire is free from steel defects such as seams and cups.

A routine test? Yes, but with higher standards. And every coil of wire on both ends must pass this and countless other tough tests before acceptance for use in making Wickwire Rope. It's these tests, coupled with over 125 years of wire-working know-how, that are your assurance of the utmost in performance, safety and long rope life when you use Wickwire Rope.

Wickwire Distributors and Wire Rope engineers throughout the country are ready to help solve your wire rope problems, and to provide prompt delivery of the rope you need from strategically located warehouse stocks. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY Preformed.

THIS 82-PAGE BOOK ON WIRE ROPE IS FREE. WRITE FOR YOUR COPY TODAY!

Thousands of wire rope users have found that the information packed in the pages of "Know Your Ropes" has made their work easier. It's full of suggestions on proper selection, application and usage of wire rope. It's easy-to-read and profusely illustrated. For your free copy, write
—Wire Rope
Sales Office,
Wickwire
Spencer
Steel, Pal-
mer, Mass.



WICKWIRE ROPE

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass.

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PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California





No deposits after 200,000 miles

Stanolube HD

How Stanolube HD helps fleet engines roll up record mileage between overhauls is convincingly told in the above letter from Mr. Milo Kunau, a fleet owner in Miles, Iowa.

Read Mr. Kunau's letter from the point of view of your own fleet. See how Stanolube HD might solve your maintenance problem or increase your fleet operating economy.

Miles, Iowa

Mr. R.T. Kinneman, Manager
Standard Oil Company
Des Moines, Iowa

Dear Sir:

I have been using your Stanolube HD and Permalube Motor Oil in my fleet of trucks for quite some time and thought you might be interested in knowing that one of my Whites (W-A-22) recently turned 200,000 miles and had never had anything done to it outside of carburetor, ignition tune-up, and one valve job.

I sent this truck to an authorized White Dealer in Davenport, Iowa for a complete motor overhaul. After tearing the motor down, I was informed by the above concern that the motor was in excellent condition. There were no deposits in the engine, pins, valves, valve guides, hydraulic valve lifters, timing gears and other parts were in excellent shape. There were no stuck rings and the oil control rings were clean and free. The truck company re-assembled the engine, using a new set of rings and ground the valves.

I thought you would be interested in knowing the results obtained while using your products and knowing how well pleased I am with the performance obtained.

Yours truly,

Milo Kunau
Milo Kunau

You'll find Mr. Kunau's experience with this truly heavy-duty detergent oil a good clue to lower maintenance for you. You can verify his experience by trying Stanolube HD in one of your hard-working fleet units. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA)



(Continued from page 150)

local offices of the state employment services, place an ad in the paper, or call a regular agency. If a qualified man appears on the job and seeks work, he should be hired without questioning his union affiliation.

The home office has distributed a booklet explaining the Taft-Hartley Act. Read it, and act accordingly when hiring.

Job offices must handle their own labor relations. Confer with your area office about joining the local chapter of the Associated General Contractors, the American Road Builders Association Builders Exchange, or other trade associations. Find out what labor contracts such membership may obligate us for. In case of union problems, or actual trouble, get in touch with your area manager. Avoid signing labor agreements directly, and if it has to be done, consult the area office first, watch for conflict of territory jurisdiction, and get legal advice. Watch state labor legislation and legal interpretations for important changes. Notify the home office of these changes.

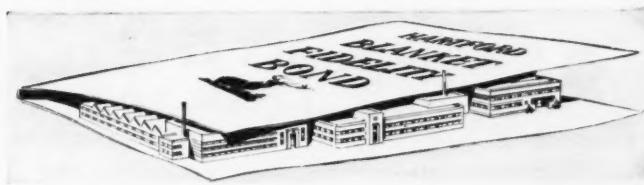
Timekeeping Duties—On the smaller jobs, timekeeping and all other office work may be handled by one man. Larger jobs may require additional men and a subdivision of this work.

Where necessary to check the men working, make inspections three to five times a day and at irregular times, especially at the start of a job to prevent the crew from getting into bad habits. The daily time reports are used as time check sheets. List crews by sheets so each of several checkers can take part of the sheets when the crew is large. Numbered brass checks or plastic buttons should be issued to identify the men by number. On jobs in a confined area, timekeeping may be done by issuing these checks at the gate, but this does not completely eliminate the need for time checking.

The timekeeper reports any disciplinary matters to the job superintendent. The timekeeper has no authority to discharge men, and should not become involved in any disputes with the crew. He should be cooperative, and while not lenient, he must be fair and agreeable, and hold the confidence of the crew.

Each day the timekeeper enters on daily time reports the number

(Continued on page 156)



How can employers guard against large dishonesty losses?

Your judgment in picking people for positions of trust may be of the very best, but it has to be based mainly on past records of character and integrity. It can give you no guarantee against future developments which may induce the most trustworthy employee to succumb to the combination of temptation and opportunity and become an embezzler.

Fidelity Bonds offer business management the only, positive means for dealing with this employee dishonesty risk. Such protection in its most modern and highly perfected form can be provided for your organization through Hartford Blanket Fidelity Bonds which offer:

1. Repayment of losses of money, merchandise or other company property stolen by employees, whether or not the identity of guilty employees is known.
2. Coverage on all personnel—executives, sales staff, office workers and construction crews, watchmen and maintenance men, etc.
3. Hartford Blanket Bond rates are at the lowest point in history.
4. Automatic protection against personnel changes, eliminating the danger of uninsured losses.
5. Reduced record-keeping and handling expense, since it is unnecessary to report personnel changes or make premium adjustments during the bond term.
6. Freedom from personnel troubles—because Hartford Blanket Bonds cover all employees alike, there is no cause for any feeling of discrimination.

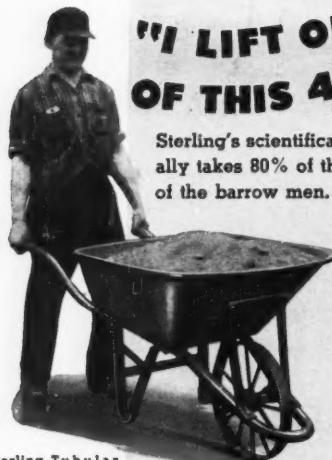
These and many other benefits of Hartford Blanket Fidelity Bonds are worth your consideration. Your Hartford agent or your own insurance broker will gladly furnish full information on request.

HARTFORD

HARTFORD FIRE INSURANCE COMPANY
HARTFORD ACCIDENT AND INDEMNITY COMPANY
HARTFORD LIVE STOCK INSURANCE COMPANY
Hartford 15, Connecticut

Year in and year out you'll do well with the Hartford





**"I LIFT ONLY 80 LBS.
OF THIS 400 LB. LOAD!"**

Sterling's scientifically balanced construction actually takes 80% of the load off the arms and backs of the barrow men. With Sterling Wheelbarrows, crews work faster, make more trips, haul more yardage per day. And quality, all-welded construction keeps Sterlings on the job longer, reduces job costs.

Deliveries of Sterling all-steel, tubular framed barrows are being stepped up as rapidly as the material situation permits.

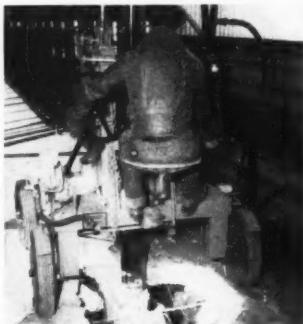
Sterling Tubular
Frame Barrow—all
welded, no rivets,
lapped at corners.
Steel re-inforcing
rod around top edge.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Sterling
WHEELBARROWS

Look for this Mark of
STERLING Quality

WHY PAY SIX TIMES MORE FOR YOUR BREAKING?



THE MIGHTY MIDGET

Show breaking out 8500 square feet of platform supported by heavily reinforced concrete beams 12" x 14". Machine readily demolished slab and beam together, breaking out an approximate 6000 square feet in six hours time, powered by 160' compressor. Total thickness where beam intersected—20".

Ask your dealer or write
for information.

HOW TO ESTIMATE CONSTRUCTION COSTS

A guide to sound bids

SAMPLE CHAPTERS

- Estimating In General
- Handling and Transporting
- Excavation
- Concrete
- Masonry
- Roofing and Flashing
- Lathing and Plastering
- Plumbing
- Overhead and Profit
- Complete Estimates
- Approximate Estimates



Revised 2nd Edition

By H. E. Pulver
Civil and Structural Engineer
653 pages, scores of tables,
\$6.00

A reliable working guide that covers every element to be considered in bidding for a construction job. It includes step-by-step procedures for making accurate estimates on concrete work . . . steel structures . . . installation . . . any kind of construction you're apt to meet in modern building plans. Practical examples of estimating work out in detail demonstrate how to apply the methods outlined.

10 DAYS' FREE EXAMINATION

McGraw-Hill Book Co., Inc., 330 W. 42 St., NYC 18
Send me Pulver's CONSTRUCTION ESTIMATES AND COSTS for 10 days' examination on approval. In 10 days I will remit \$6.00 plus a few cents delivery charge, or return the book postage paid.

Name _____

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City _____ Zone _____ State _____

Company _____

Position _____ CM-2-19

*SAVE! We pay mailing costs if you send cash with this coupon. Same return privilege.

(Continued from page 155)
of hours worked by each employee. A separate sheet is ordinarily used for each crew, and a clipboard is useful. Each man's hours are shown in total, and also a code number indicating what work he performed. This "labor cost distribution" should be checked with the job superintendent, engineer or foreman, if in doubt. Fill in the wage rates and extend the pay to the same code column as the hours. Cross-footing of each sheet is done daily. At the end of each pay period, the total pay on the daily reports must equal the gross amount of the payroll.

These daily reports are the basis for preparing payrolls and labor cost distributions. Each sheet should be signed by the foreman unless the timekeeper is experienced.

On certain jobs, the time has to be kept by the foreman instead of the timekeeper because the work is scattered. The foremen usually prefer to use a daily time card. The distribution and total hours are filled in by the foremen, the cards turned in to the timekeeper at the end of each day, and the information transcribed to the daily time sheet. File the cards in case any man raises a question about his time.

Payroll Preparation—Remember that all payroll information is confidential and must not be furnished to unauthorized persons. The original payroll sheet goes to the home office, and one copy is retained by the job office. Extra copies may be requested by the area office or required by the owner's representative. Private fee jobs require an additional copy to be sent to the home office for presentation to the owner with monthly bills.

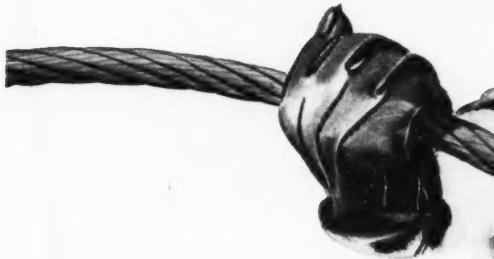
The original payroll sheets are printed with Ditto ink. Copies should be prepared by the Ditto process. Make sure that payrolls are clear and legible.

If the payroll is to be made out in duplicate or triplicate without the use of the Ditto process, the following method is suggested. Use good pencil carbon between the sheets. Staple the corners of the sheets carefully so that each corner is properly aligned. This precaution will prevent any copies from coming through with the data written off the proper line.

The employee's full name, badge number, job classification, wage rate and number of withholding

(Continued on page 159)

What He Says about **KINKING**



One of the quickest ways to ruin a wire rope is to let it kink. That, says the Bethlehem engineer, is certain death for the rope. Even though your eye may detect no damage . . . it's been done. For kinking throws wires and strands out of harmonious balance; leads to spot wear and wire breakage long before the rope has lived its normal life.

Improper unreeling is a common cause of destructive kinking. Never lay the reel on its side without a turntable and attempt to lift off the rope. That's just asking for trouble. Instead, jack up the reel so that it revolves freely; then, while one man "brakes" the reel, another should slowly pull off the rope in a straight line.

Be careful, too, when handling a *coil* of rope—one not wound on a reel. Merely grabbing the rope and starting to pull will invariably produce damaging loops and kinks. To uncoil, place the end of the rope on the ground, then roll the coil like a hoop, in as straight a line as possible.

The Bethlehem field engineer will gladly give any helpful pointers on the proper way to unreel and uncoil wire rope. It's something *every* user of rope should know.

Remember, there's no charge for the services of the Bethlehem representative, no matter how much time he spends with you. It's his job to help you in selecting wire rope and getting the best service from it. Feel free to call him on any wire-rope problem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by

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When you think WIRE ROPE . . . think BETHLEHEM

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"We are very pleased with our Model 34--
as it is always ready for work!"



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for the piers. 55 ft. Boom, 32 ft.
Leads. 3300 lb. Drop Hammer,
700 lb. Pile Cap.

Placing 75 ft. Trusses weighing
about 7500 lbs. each. Trusses had
to be lifted over telephone-wires.



Dependability, large capacity, per pound of weight, and fast operating speeds are typical of all LIMA equipment from the $\frac{3}{4}$ yard Paymaster to the 6 yard shovel and 110 ton crane. Performance records like those mentioned in the letter above are being made by satisfied users the country over. They are the

result of expert engineering, superior workmanship and higher quality materials which go into every LIMA unit. Moreover, every LIMA is subjected to gruelling performance tests before shipment, assuring continuous dependable performance from the day it is placed in service.

It will pay you to consult your nearest Lima Sales Office or representative before you buy your next shovel, crane or dragline. Offices in principal U.S. cities.

Lima Shovel and Crane Division

LIMA, OHIO

OTHER DIVISIONS: Lima Locomotive Works Division; Niles Tool Works Co.; Hoover, Owens, Rentschler Co.



(Continued from page 156)

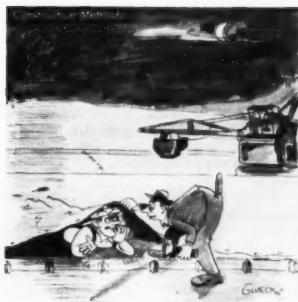
exemptions (from Form W-4), are written on the payroll as the starting point for all subsequent payroll work. The payroll sheets are set up at the beginning of each payroll period, and the number of hours worked each day by each employee is posted daily from the daily time reports. By daily posting, the payroll work is always current and there are no delays in paying off discharged employees. Payoffs and advances are both recorded on the payroll at the time they are made.

At the end of the payroll period, make the additions and extensions. First, add the total number of regular hours and the total number of overtime hours for each employee, then multiply by the hourly rates to get straight time, overtime and total earnings. Remember that overtime applies to office men and engineers as well as manual workers. Be familiar with the terms of each union agreement (if any exist), and with the Fair Labor Standards Act. In hiring, written notice of the rate is furnished to the payroll clerk on the hiring slip.

After total earnings are figured compute the deductions. The home office has the responsibility of informing the job office when each employee has earned a total of \$3,000 during the calendar year so F.O.A.B. deductions can be stopped. Deductions for Federal withholding tax are always made from a prepared table. Other deductions may also be made for State Unemployment Compensation, for meals, union dues, or state withholding taxes.

If the state in which the job is operating has a withholding tax

(Continued on page 160)



"Awright—release the tarpaulin, stoop—I'm studying the drying conditions of this mix first hand!"



MODEL 90M
6 inch

MADE IN ALL SIZES
7M - 10M - 15M - 20M
30M-40M - 90M-125M

GORMAN-RUPP'S NEW PUMPS

CHALLENGE ANY PUMP TO
MATCH THEIR PERFORMANCE

With a new complete line of Contractors' Pumps, Gorman-Rupp has topped their own past high record of performance with a better pump —

- QUICKEST PRIMING
- HIGHEST PRIMING
- PUMPS MORE DIRTY WATER

Compare them for priming speed:

The new Model 15M (3") primes at 25 ft. suction lift in 61 seconds.

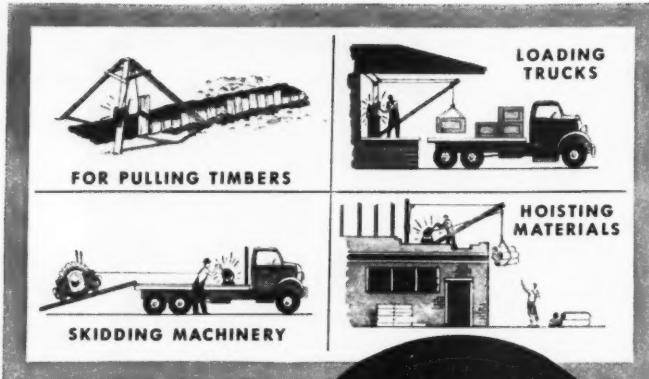
The new Model 90M (6") primes at 25 ft. suction lift in 44 seconds.

And the Gorman-Rupp is still the most simple pump --

No ports, no valves, no clean-out plates, nothing to cause stoppages.

Write for the new Contractor's
Bulletin 8-CP-11

THE GORMAN-RUPP COMPANY
MANUFACTURERS OF
TRACTOR-PUMPS
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Halls, Scraper Trunks,
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Builders, Trail Blazers,
Carrylays Also—

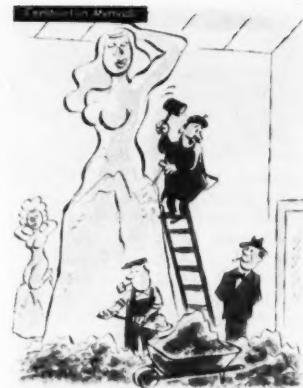
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SCARIFIED TEETH

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the ability to specialize and
mold through our own
rolls and forged at the
highest quality you need.

All widths, lengths, and
thicknesses. *R. N. C. & G.*
ready to fit your machine.

Consult your international
ally recognised Blade Spec
alist for his special
bulletins, giving type and
name of machines you
operate—get set for Blades
early.

Shunk
MANUFACTURING COMPANY
Established 1854
BUCKEY, OHIO.
Member of A.M.D.



"Of course most of my income is derived from selling the residue for road ballast."

(Continued from page 159)

law covering non-resident employees, the job office should become thoroughly familiar with the law so that required deductions are not overlooked. If any employee's status is questionable, a certificate of residence should be furnished by him.

Totals of various deduction columns and prepaid amounts should balance with the total of the column for "Net Deductions and Prepaid" before the amounts of the "Net Pay" are entered. The total of "Net Pay" for each page is then balanced against the amount of "Total Earnings," less the amount of "Net Deductions and Prepaid."

The job office should take particular care that all amounts advanced to employees are posted to their record on the payroll sheet at the time the advance is made. An acknowledgement should be signed by the employee at the time of the advance, and filed in case of dispute.

Check writing—Payroll checks are obtained from Minneapolis. They are printed by the Todd Co. in duplicate. The original is the negotiable check, and the duplicate copy is sent to the home office with the original payroll as an earnings record. On all large jobs, the name of the bank will be imprinted in the lower left-hand corner of the check. On smaller jobs, get a rubber stamp of the bank name, and stamp the name of the bank in the place.

The issuing date of the check and the full name of the employee

(Continued on page 163)

"HOW GOOD WERE THE GOOD OLD DAYS?"



In some respects, they were wonderful. In others, terrible. Take that matter of truck mixer sizes and capacities. There was a time when trying to determine true capacity was like looking in a dark room for a black cat that wasn't there.

That's why we formed the Truck Mixer Manufacturers Bureau—to set up standards that would guarantee sizes and capacities, for your convenience.

All you have to do now is look at the Bureau's rating plate on each truck mixer. That's your guarantee of size and capacity . . . your protection against "outlaw" sizes . . . your assurance that you can figure accurately your costs based on truck mixer operation.

So that rating plate does away with a lot of the troubles you used to have in the good old days. We think it does away with a lot of our old troubles, too. We think it helps us in our manufacturing and sales policies, and in our relations with you, our customers.

Yes, the rating plate of the Truck Mixer Manufacturers Bureau is one thing that would have made the good old days even better.



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Affiliated with The National Ready Mixed Concrete Association

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Milwaukee, Wis.

THE JAEGER MACHINE COMPANY
Columbus, Ohio

THE T. L. SMITH COMPANY
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If you want your equipment to do more

build it with Steel that does more!

TODAY's rising labor costs make it imperative to increase as much as possible the speed, the power and the capacity of every kind of earth moving equipment. And you just can't do it with ordinary steel.

Here's a job for *high strength steels* . . . steels like U·S·S COR-TEN, or U·S·S MAN-TEN, or U·S·S Manganese-Nickel Copper . . . steels that at low cost give you extra strength, greater toughness, higher resistance to shock, abrasion and atmospheric corrosion. These are qualities that you *have* to build into big-capacity, high-powered, fast-stepping bulldozers, scrapers, ditchers, power shovels, etc., if you want them to stand up under slam-bang, high-speed operation day after day.

Only with steels like these that *do more* can your equipment be built rugged enough to do all the work it's designed to do. Without them, it won't stay on the job as it

should . . . without them, high operating and maintenance costs will cut deep into your profits.

For more than 14 years now we have been cooperating with leading builders in applying these service-tested steels to equipment that is famous for its stamina and performance. We'd be pleased to put at your disposal the wealth of practical engineering and fabrication data we have accumulated by this experience.



AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO • CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
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U·S·S HIGH STRENGTH STEELS

U·S·S COR-TEN • U·S·S MAN-TEN • U·S·S MANGANESE-NICKEL-COPPER

UNITED STATES STEEL

9-348

(Continued from page 160)

are typed in the proper spaces. See that the typist is careful to copy the exact, full name as it appears on the payroll.

When errors are made in typing or computing a check, the check is marked "VOID", and the lower, right-hand signature corner is torn off and destroyed. The voided original is sent to the home office with the duplicates of the other checks. The duplicate of a cancelled check may be destroyed.

The negotiable (original) checks are given to the job superintendent, or whomever else is authorized to sign, for signature. These checks must be ready for distribution to the crew within 48 hr. after the end of the payroll period.

The serial numbers of pay checks are posted to the payroll sheet in the space provided at the extreme right. This step must not be overlooked, as the payroll sheets serve as a check register. Duplicate checks may be used to post these numbers while the original are being signed.

Distributing Checks—Distribution of the checks should be made by the office manager. He may delegate this work to a timekeeper, but it is essential that it be done by an honest and alert person. No checks are to be given to unauthorized persons, and if an employee requests that his check be given to someone else in his absence, exercise discretion in doing so. Request a signed receipt for the check, and later make a direct inquiry to learn if it was delivered.

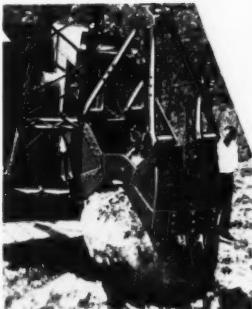
Check Reports—When the payroll has been completed and the checks issued, the job office fills out a check report to be sent to the home office with the original payroll. These check reports must be mailed to Minneapolis on the day the checks are issued, as they are used to control the bank balance.

Layoffs—When a layoff occurs during the pay period, check the man's tool charges and pay advances. Fill out the discharge information on the man's hiring slip. This is needed for unemployment compensation inquiries, and in case he applies later for re-hiring.

Weekly Labor and Superintendent's Reports—The total of the Daily Time Reports is checked to be sure it equals the gross amount of the payroll for the same period. When this has been done, combine

(Continued on page 164)

**CLOSING POWER Plus
WHEN AN OWEN BUCKET
Clamps Down**



It's the "Plus" features in a product that contribute largely to outstanding performance and build user satisfaction and profits.

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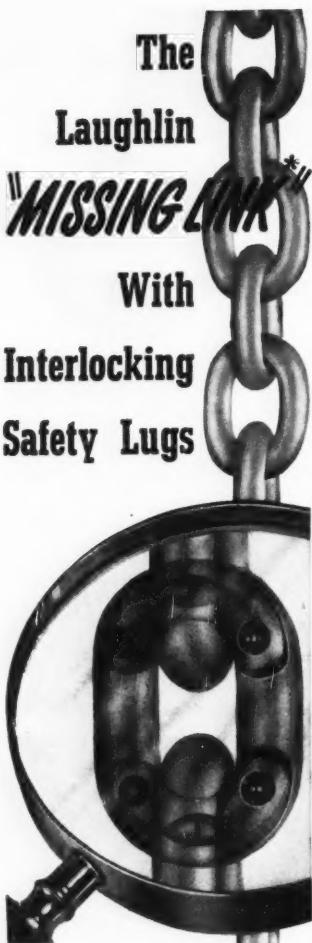
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THE MOST COMPLETE LINE OF D.R.P. FORGED WIRE ROPE AND CHAIN FITTINGS



(Continued from page 163)
the Daily Time Report totals by code accounts on an intermediate work sheet. Next, the weekly labor cost distribution is prepared. To arrive at a list of code accounts, use the original estimate. Parallel the estimate so a weekly cost comparison can be made.

Furnish a pencil draft of this report each week to the engineer or superintendent to get the quantities of "Work Performed." After receiving quantities, calculation of the unit costs is done on this pencil draft. Check your computations.

The form for Weekly Report of Superintendent is combined with the Weekly Labor Cost Distribution Report as both are prepared at the same time, are distributed alike, and the information is related. This report is filled out on the pencil draft. The Superintendent should make his report short but complete to give his area office (as well as the home office) a good picture of the conditions and progress of the job. Job control is maintained by the area office largely through this combined weekly report of unit costs and job conditions. The responsibility of writing this report may be delegated to an engineer, but the report must be reviewed and signed by the superintendent. The review of the Daily Job Diary will help in writing this weekly report.

When the pencil draft of the labor distribution and superintendent's report has been made up and all figures carefully checked an original and copies are made out by the Ditto process or typed, signed by the superintendent, and sent to the home office and the area office. These reports should be neat and legible.

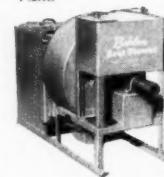
EDITOR'S NOTE: Part II of this series will appear next month.



"Sometime I'd like to sneak up there and see what's going on!"

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- Ideal for Concrete Work
- Quickly Thaws Out Materials
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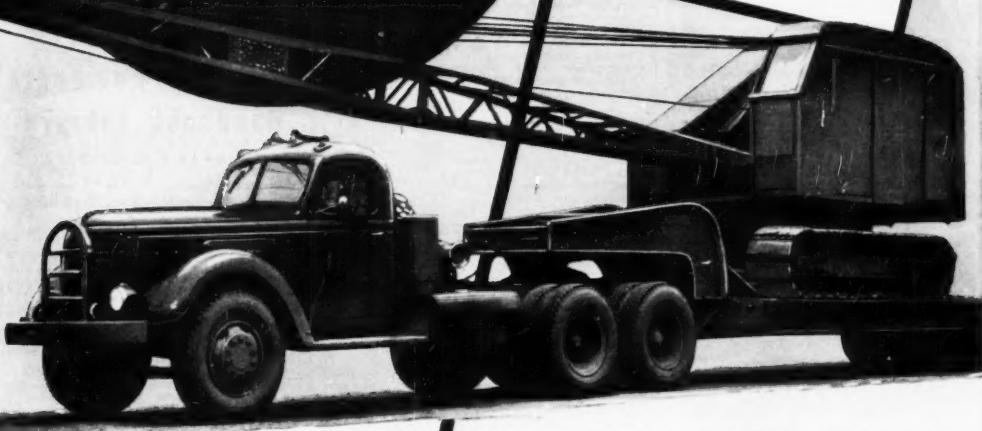
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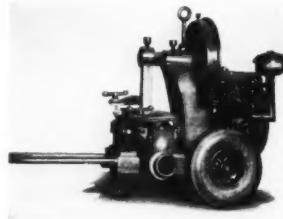
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Address _____

City _____ Zone _____ State _____

Company _____

Position _____

C.M. 2-19

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(Classified Advertising)

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All metal . . . can be raised from 19" to 28" by hand lever. Seat moves forward or backward. Chair bolts down tight. Built for government . . . stands hard service. Now selling \$15

at

for below the price

of production.

WEIL'S
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IN STOCK — FOR SALE FOR IMMEDIATE DELIVERY

NEW PLAIN HOT ROLLED
ANNEALED MILD STEEL SHEETS
Approx. 180 Tons—12 Gauge x 36" x 96"
LOCATED IN NEW YORK

NEW HOT ROLLED MILD STEEL PLATES
Approx. 330 Tons—3/16" x 5' x 15'
LOCATED IN NEW YORK

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LOCATED IN BALTIMORE

We warrant all of the above to be new prime and mild steel, carbon not exceeding .12 max.

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Bekman 3-3041

CABLE ADDRESS: FABKANT, NEW YORK

Member: Association of Steel Distributors

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Patent Practice before U.S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request.

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Featuring Additional Products,
Specialties & Services for
the Construction Industry

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Faster—More Economically

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Waterproof with Formula No. 640

A clear liquid which penetrates 1" or more into concrete, brick, stone etc. seals holds up to 250 lbs. per sq. in. hydrostatic pressure. Cuts concrete piles quickly—no mixing—no cleanup no furring—in membranes. Write for technical data—free sample.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

ATLAS CONCRETE FORMS
Walls • Cylinders • Floors • Sewers
Irvington FORM & TANK CORP.
Irvington, N. Y.

This WHERE TO BUY Section

supplements other advertising in this issue with these additional announcements of products and services essential to official and economical operation in the construction industry.



Sonotube-

CONCRETE FORMS

for Piers - Columns - Posts - Piles

SONOTUBES are now available in inside diameters from 6" to 24" and lengths up to 24'—the fastest and cheapest way to form piers or columns.

SONOTUBES are easily cut to any desired length by handsaw on the job.

Align-



Brace-



Pour-



SONOCO PRODUCTS COMPANY
HARTSVILLE, S. C. MYSTIC, CONN.
ROCKINGHAM, N. H. GARWOOD, N. J. LOWELL, MASS.



REG. U. S. PAT. OFF.

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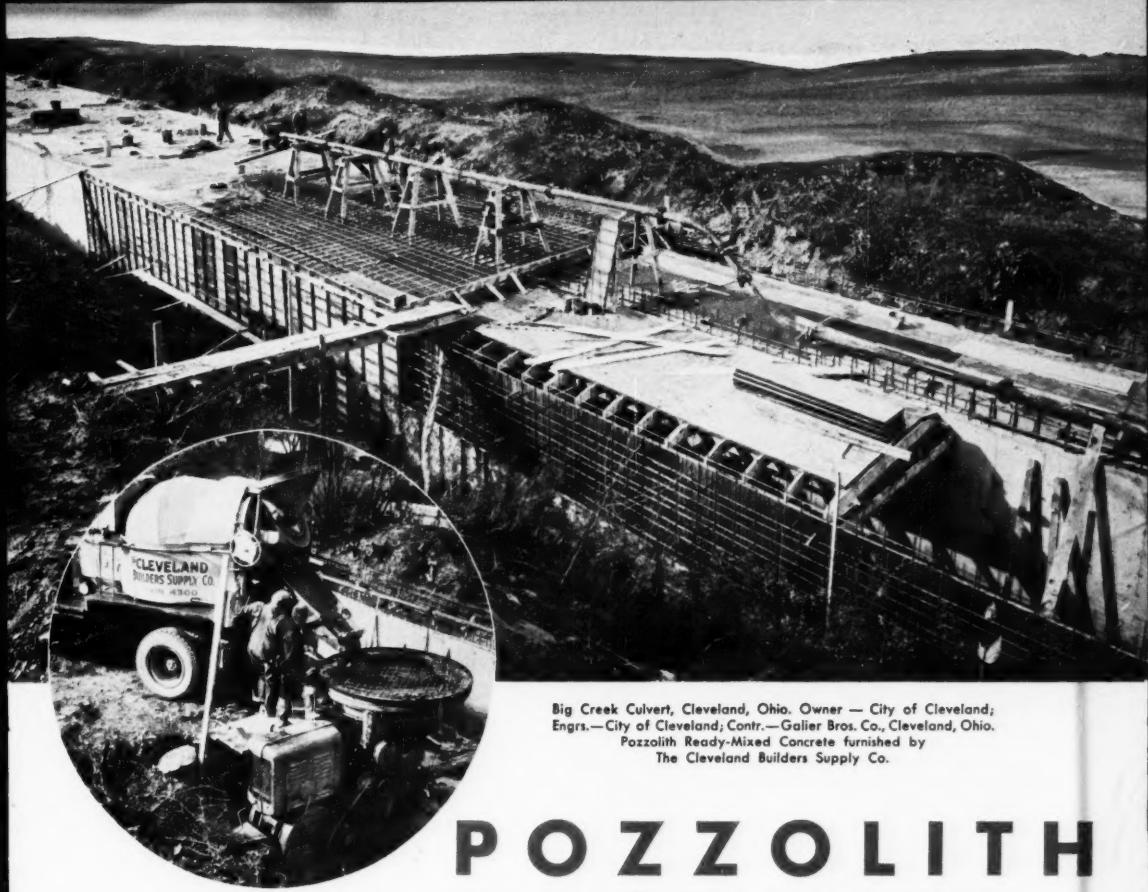
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Big Creek Culvert, Cleveland, Ohio. Owner — City of Cleveland;
Engrs.—City of Cleveland; Contr.—Galler Bros. Co., Cleveland, Ohio.
Pozzolith Ready-Mixed Concrete furnished by
The Cleveland Builders Supply Co.

P O Z Z O L I T H

Pumped Concrete Here . . .

**OTHER MASTER BUILDERS
PRODUCTS IN WHICH CEMENT
DISPERSION IS EMPLOYED**

EMBECO...

For non-shrink grouting and re-integration.

MASTERPLATE...

Industry's toughest floor . . . "the iron that stays on top."

OMICRON MORTARPROOFING..

Controls shrinkage cracks; minimizes leaky brickwork, also re-tempering; contains stearate.

In addition to producing the easy placeability and good cohesiveness required for this pumped concrete job, Pozzolith, cement dispersion, provided these important advantages:

1. REDUCED PLACING COSTS
2. DENSE, SMOOTH CONCRETE
3. WATERTIGHTNESS, DURABILITY
4. GOOD STRENGTH

Normal concrete of *any given quality* is produced at lower cost with Pozzolith than by any other means, such as the addition of extra cement or of any other admixture either added at the mixer or interground.

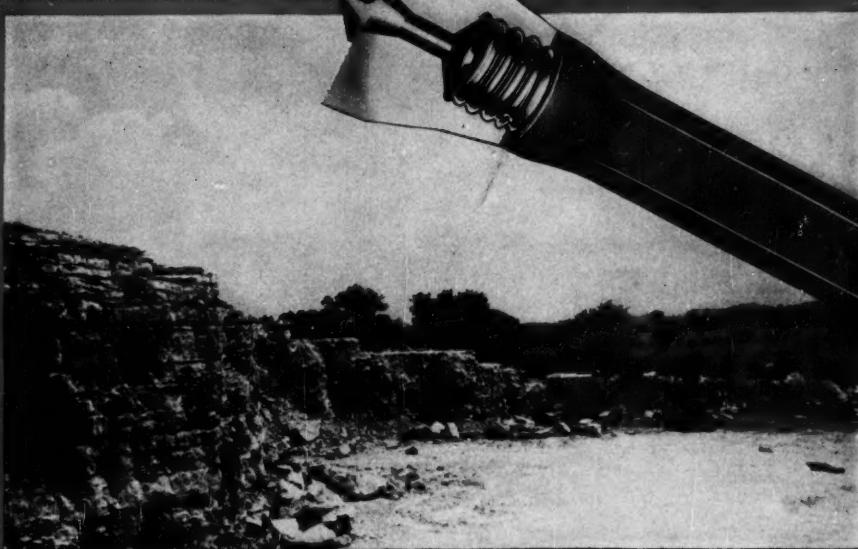
Write for information and Pozzolith booklet.

MASTER  **BUILDERS** 

CLEVELAND, OHIO TORONTO, ONTARIO

Limestone quarry of the Ralph Rogers Company, Franklin, Tenn. Drilling equipment

comprises 2 wagon drills, 2 pneumatic hammers, and one 500 cu. ft. compressor.



Why this large paving contractor uses TIMKEN® Rock Bits

The Ralph Rogers Company of Franklin, Tenn., operates a limestone quarry in connection with the production of asphalt aggregate.

Rock drilling at this quarry is a 100% Timken rock bit operation because the quarry operator has found Timken rock bits superior in performance and more economical in use than the bits previously used.

Furthermore, by preventing the steel from bottoming in the bit, the Timken one piece, solid steel shoulder construction has eliminated drill steel breakage that previously was a source of delay and expense.

No matter where you are, there's a Timken rock bit distributor within telephone call. Conversion and reconditioning shops also are conveniently located for quick service. Put Timken rock bits to work now; cut drilling costs, increase production.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
ROCK BITS

THE TIMKEN ROLLER BEARING COMPANY
CANTON 6, OHIO • CABLE ADDRESS "TIMROSCO"